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Proper Fusing of Enamel Vital

Plant Making Gas Stoves Coats Both Sheet Steel and Iron Castings—Japanning and Nickel Plating Done, Also

BY F. W. MANKER*

FINISH is one of the major problems of all plants manufacturing products of iron and steel and especially does this apply to gas stoves. Not only must the finish be of artistic qualities and stand up under hard treatment, but it must also withstand repeated high temperatures. Porcelain enamel fused on iron and steel has become the most popular of all stove finishes and improvement in the technique of its manufacture and application is being made steadily.

Art and science have combined to make the modern stove a thing of beauty as well as a unit simple and efficient in utilization. This is demonstrated in the products put out by the Detroit-Michigan Stove Co., Detroit. The Detroit Stove Works, the parent organization, was established 62 years ago. The present company, a consolidation of the Detroit Stove Works, the Art Stove Co. and the Michigan Stove Co., is said to be the largest manufacturer of stoves in the world.

The Detroit Stove Works manufactured the Detroit Jewel gas ranges, combination ranges and furnaces; the Michigan Stove Co., produced the Garland range, gas, coal and combination; and the Art Stove Co. made gas and combination ranges and furnaces. These three divisions are now consolidated within the confines of a single plant, which has a production capacity of 850 stoves daily.

While these three lines were, for the most part, parallel and competing, each had different designs, features and sales arguments. Today they are, therefore, being produced as before, except where the manufacture of certain parts could be standardized for all. The one plant in which the three divisions are now housed covers 13½ acres and includes 16 modern, brick and fireproof buildings. All are four stories high except the foundry and enamel departments, which are one story. The plant is served with spur tracks from several railroads and has frontage and dock facilities on the Detroit River.

One Foundry Serves All Lines

Consolidation in the manufacture of different parts for these three lines starts with the one foundry, where all castings are made. All enameling is done in a single enameling plant and all press operations are performed in one press department. After this the various parts for the separate lines are segregated and sent to the one of the three divisions for which they are intended.

Gas ranges form the bulk of the production of this plant, more than 200,000 being produced annually. The castings made in the foundry include the front and top oven doors, broiler doors, two grates, end shelf, top support, two journals (hinges), five burners, burner rests, back guard supports, manifold supports, etc. Castings for the various other ranges and furnaces are made here also. There are four cupolas, with a capacity for 120 tons of castings daily.

Emery wheels, tumblers and sand blasting machines are used in the grinding department for thoroughly cleaning the castings. After this they go to the tap and drill room, where batteries of drill presses drill the proper holes and tap them with the correct threads. Among other machines, multiple drill presses hold four star burners at a time, and drill as many as 40 holes in a single operation. From here the various castings are sent to one of three finishing departments: japanning, nickel plate or enameling. After the different finishes have been put on, the parts are stacked in a central, common stock room to be drawn, when required, for assembly.

Sheet Steel Forms Many Parts

Items of which sheet steel is the base originate in the press room and for the gas range include legs, range body, body top, high shelf top, high back and ends,

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Row of Spraying Booths in Enameling Department. Enamel is carried in the buckets overhead.

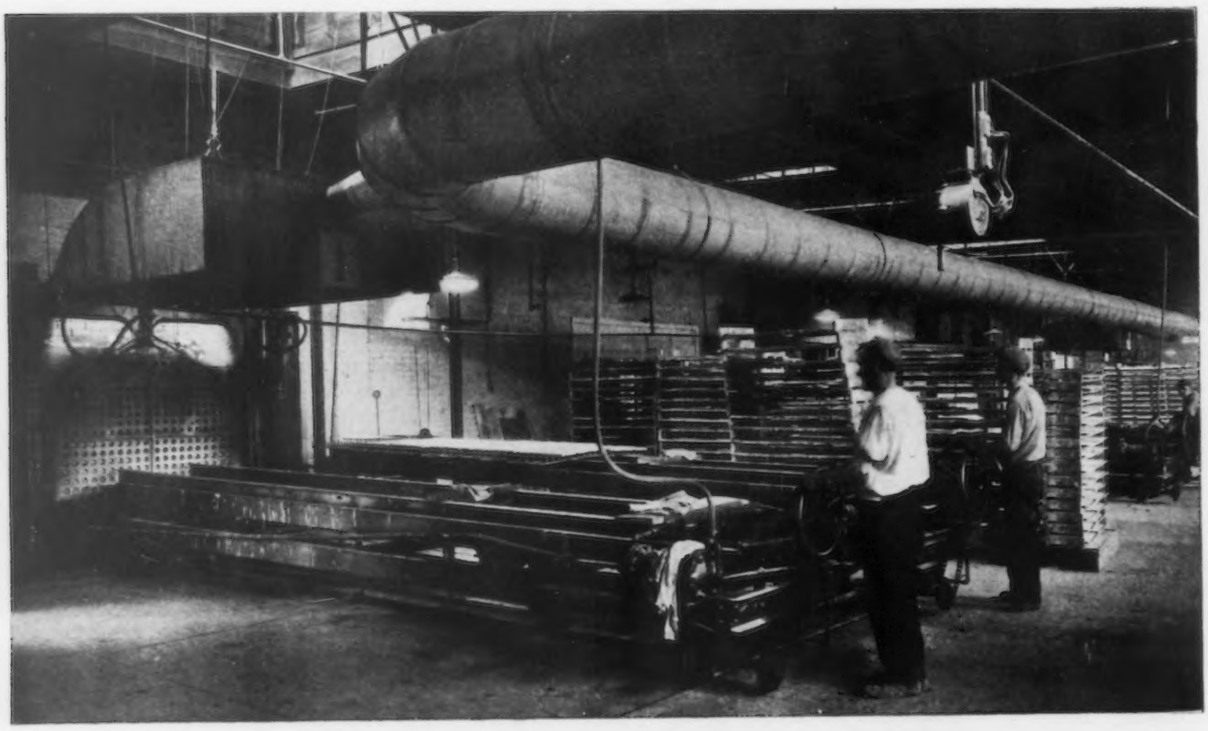
oven and broiler door panels and linings, stove linings, drip and broiler pans, splashes, back guards, etc. The great size of this press room can be gaged from the fact that more than 125 power presses are located here and approximately 450 different active dies.

The pressed steel parts, as did the castings, go then to one of the three finishing departments, depending on the finish each is destined to have. Standard equipment and standard practice are utilized in the nickel plating room. Some innovations in practice and improvements over accepted apparatus have been made in the japanning and enameling departments.

Raw materials for the different enamels are received in a separate room, compounded, burned and ground. The enamels are then stocked in quantity ready for use by the sprayers or dippers, as may be the case. The ground coat is dipped and the two white coats are sprayed. Two large vats, sunk so that the tops are just level with the floor, serve this department. There are some 20 spraying booths, all equipped with air-pressure sprayers. All material is moved on trucks.

Porcelain Finish Fused On

The different coats are burned on at temperatures which fuse the enamel and produce a beautiful, porcelain finish. There are nine gas-fired furnaces built of brick, suitably stayed and insulated and equipped with

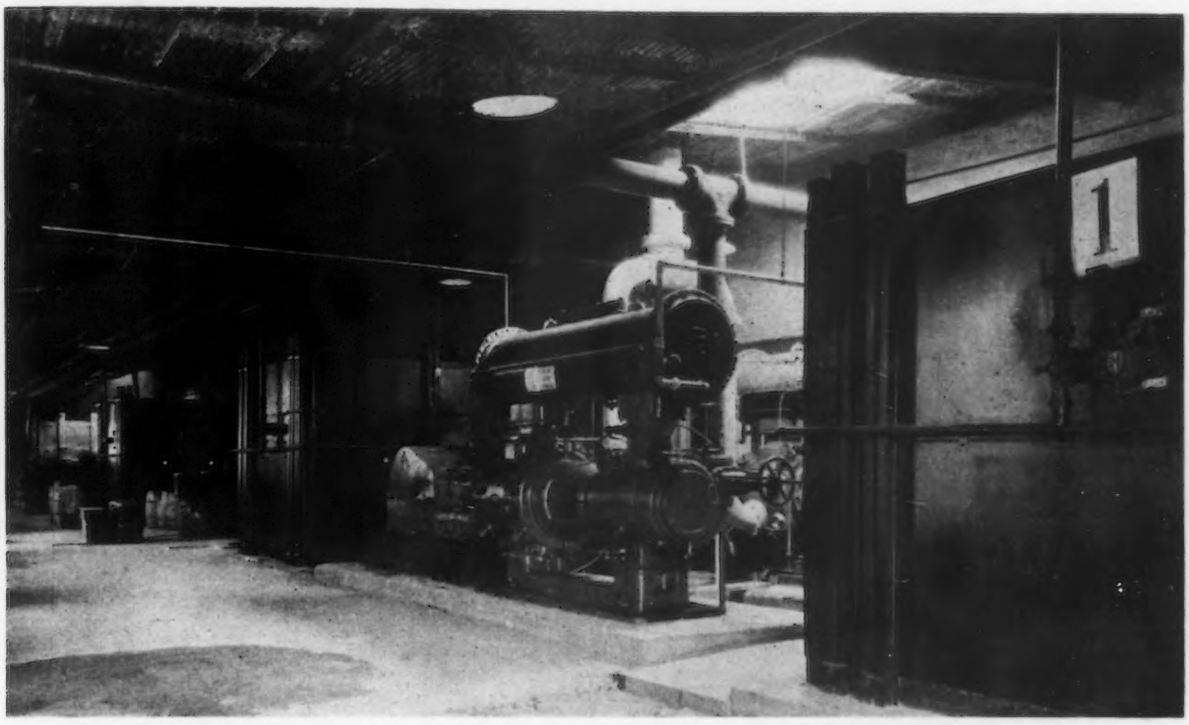


Battery of Nine Modern Enameling Furnaces Fired with Gas. One of the charging carriages appears in foreground

speed forks, electrically operated doors and automatic temperature controls. These furnaces, each 20 ft. long, 10 ft. wide and 9 ft. high, are of the muffle type. Each furnace is heated with eight burners firing under the muffle, which is of carborundum. This muffle is heated to incandescence, which in turn heats the furnace by radiation.

In this way coats of enamel are burned on at temperatures varying from 1400 to 1600 deg. Fahr. in from 3 to 5 min. Gas is supplied at 15 lb. pressure and inspirates the right amount of air for perfect combustion in patented venturi tube proportioners. The temperatures are controlled and maintained by automatic pyrometer controls. Two track tables or double forks are supplied for loading and unloading. The system of firing is a product of the Surface Combustion Co., New York.

The economies effected by this installation are realized by few enamel furnaces. Fuel economy is to be had from the gas-air proportioning device, as well as by the method of heat radiation. These two methods also reduce the heating periods and increase the capacity of the units, thereby effecting a material saving in labor. Furthermore, special and expensive labor for enamel burning is replaced by common labor, using automatic temperature control. This device also eliminates wastage due to uncontrolled irregularity in heats and burning periods, which always occur when human labor is depended upon.



Rear of Enamel Furnaces, Showing the Compressor Equipment Used (Above)

Main Assembly Line for the Stoves, Operating on a Continuous Conveyor (Below)

Immersion and Baking in Japanning

The japanning department has six gas-fired ovens served with three dipping vats and overhead traveling conveyors. The vats containing the liquid japan are

about 3 ft. square and 4 ft. deep, and are sunk so that the tops are level with the floor. The parts to be japanned are hung in racks suspended from the overhead conveyors. As soon as the racks are loaded they are lowered into the vats, so that the work is immersed, after which they are raised and the excess japan allowed to run off. Racks and work are then run into the ovens and baked at a temperature of around 450 deg. Fahr. for approximately 50 min.

These ovens are each 20 ft. long, 12 ft. wide and 6 ft. high and are heated indirectly. Separate combustion chambers, provided for each unit, are equipped with four gas burners. The heated air is forced into the ovens by electric fans, through ducts arranged to give it free circulation and even distribution throughout the ovens. The burners are supplied air at from 1 to 2 lb. pressure, which inspirates gas at atmospheric pressure, through patented venturi tubes, in proper proportion for complete combustion.

While this type of oven does not lend itself well to automatic control, material economies are effected by the system of heat circulation and method of proportioning the fuel and air mixture. The system of firing here, also, is a Surface Combustion product.

The three different lines of stoves have three different assembly departments housed in two separate buildings. These assemblies, similar to the final assembly in an automobile plant, consist of long, traveling slat conveyors. The different parts are stacked at intervals along both sides and, as the stove bodies travel along, men put on the different parts. At the end of the line the gas range is connected to a gas pipe and tested. The crating, labeling and shipping of these three lines are done in three separate departments.

Large Shipment of Rolling Mill Equipment

To Roll Sheet Bars, Skelp and Strip Steel from Large Ingots Without Reheating

ONE of the largest shipments of rolling mill machinery, recently made from Pittsburgh, consisted of a continuous rolling mill of 15 roll stands and gear reduction drives designed and built by the Mesta Machine Co. and shipped from its plant at West Homestead, Pa., to the Bethlehem Steel Co. plant at Sparrows Point, Md., where it will be put into operation.

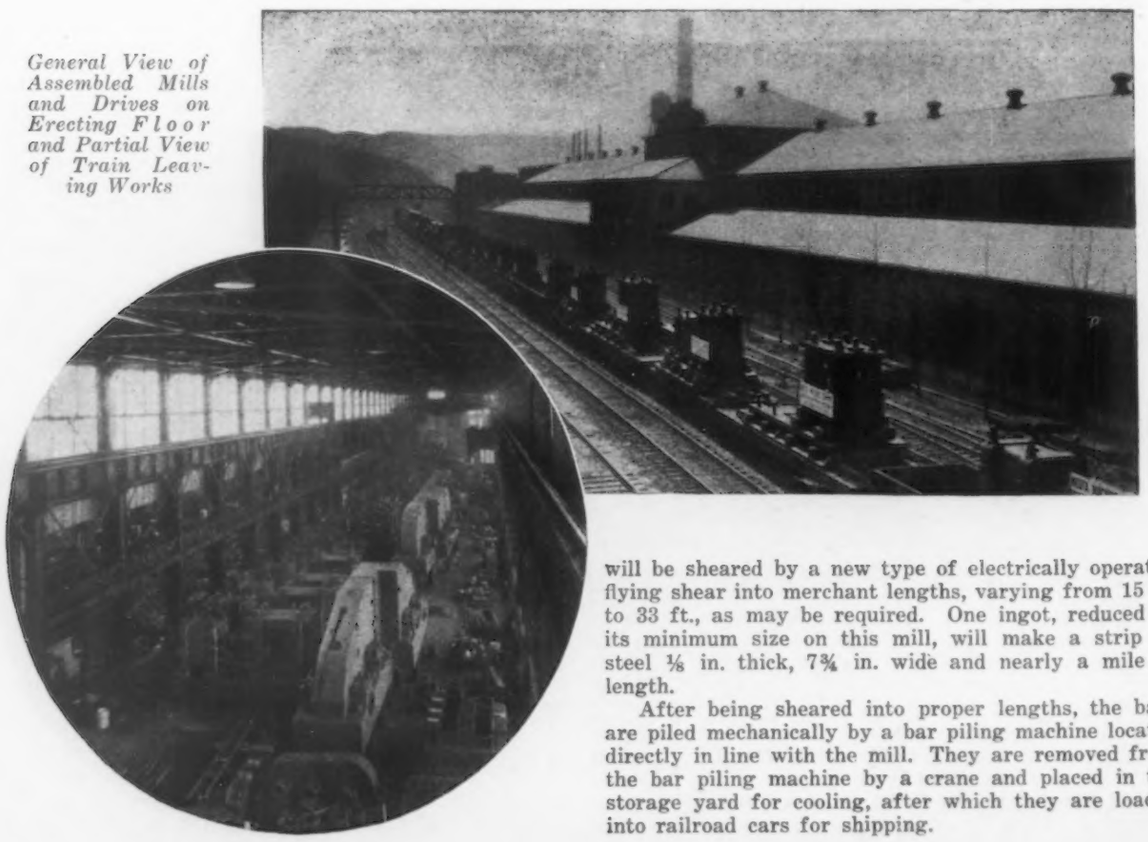
This mill will be installed directly following a 46-in. reversing blooming and slabbing mill, also designed and built by the Mesta Machine Co. and put into operation last year. The complete unit, consisting of the blooming and slabbing mill and the continuous mill recently shipped, will produce slabs, blooms, sheet bar, skelp and strip steel direct from the ingot in one heat without necessity for reheating during the rolling process. To operate the continuous mill at its maximum capacity 25,000 hp. will be required, and for the blooming and slabbing mill 20,000 hp., making a total 45,000 hp. required for the complete unit.

The magnitude of this equipment can be further visualized by the fact that the maximum size of ingot rolled by the blooming and slabbing mill will weigh 44,000 lb. An ingot of this size is rolled into slabs; the maximum size of slab produced being 24 x 60 in. These slabs sheared into suitable lengths are transferred to another mill to be rolled into plates.

Ingots rolled by the blooming and slabbing mill, which then follow through on the continuous mill, weigh about 15,000 lb. each. These ingots will be reduced in the blooming and slabbing mill to 8 x 8-in. cross section for sheet bar production, or to 7 x 22-in. cross section for the production of wide skelp and strip. The 8 x 8-in. or the 7 x 22-in. billets, as the case may be, will be further reduced in the continuous mill to sections approximately ⅛ x 7¾ in. minimum for sheet bar and ⅛ x 24 in. minimum for skelp.

Emerging from the continuous mill in reduced section at a speed of 1300 lin. ft. per min., the product will be sheared by a new type of electrically operated flying shear into merchant lengths, varying from 15 ft. to 33 ft., as may be required. One ingot, reduced to its minimum size on this mill, will make a strip of steel ⅛ in. thick, 7¾ in. wide and nearly a mile in length.

After being sheared into proper lengths, the bars are piled mechanically by a bar piling machine located directly in line with the mill. They are removed from the bar piling machine by a crane and placed in the storage yard for cooling, after which they are loaded into railroad cars for shipping.



General View of Assembled Mills and Drives on Erecting Floor and Partial View of Train Leaving Works

Factors Affecting Total Carbon in Steel

Important Results from Study of Six German Blast Furnaces—Silicon Content and Crucible Temperatures Affect Carbon Content

A CONTRIBUTION from the Breslau Institute of Technology, by A. Michel, is published in *Stahl und Eisen*, April 28, 1927. It is on the influence of blast furnace operations as affecting the total carbon of the pig iron made.

The ordinary range of total carbon fluctuation in pig irons is about 1.50 per cent, and so far no definite laws have been discovered fixing the relation between total carbon and the other elements in iron, as well as with the conduct of the smelting process itself. Blast furnace operation has not yet advanced to the point of actual prediction of a resulting total carbon content in the iron made. And yet this is highly desirable in view of the call for either high or low percentages of this element. An exact knowledge of recarburization phenomena would, therefore, seem to be prerequisite in dealing with this question.

Iron in the Liquid Phase Important

So far, studies have been mainly made on the matter with iron in the solid phase, whereas this is only of secondary importance in blast furnace operation. Recarburization with iron in the liquid phase is of far greater import as regards the final total carbon achieved. The items to be considered are the connection between crucible temperatures and reactions and the solvent ability of the iron on the one hand, and the influence had upon the reactions by the carbon already taken up by the iron as it passes down, on the other. To these there must be added the effect of slag composition, time given for the reactions and blast temperature.

Six Blast Furnaces Studied

In order to obtain definite information on the subject, six blast furnaces were selected and complete data obtained on every phase of their operation, including qualitative and quantitative determination of the ingoing and outgoing materials and products. The measurement of temperatures and the taking of samples are subject to considerable variation. Normally the first iron is colder than that at the end of the tap. Yet, should the furnace operate colder after such a tap, and the iron collecting in the crucible come down colder correspondingly, the first of the tap may be hotter than the end. Hence it was necessary in the tests to get readings under very constant temperature conditions, and these readings and the samples taken at as nearly uniform time periods as possible.

Similarly, differences in the sulphur, silicon and manganese content were found running concurrently with temperature differences. Thus, normally colder iron at the first of the tap contained less silicon and manganese and more sulphur than hotter iron coming out later. This condition is readily explainable by noting that, as the furnace crucible is emptied of slag and molten iron, the burden comes down faster than normal, to fill this void, lowering the crucible temperature somewhat and retarding the reduction of silicon and manganese. With rising temperature this reduction becomes normal again. It may be seen, however, that uniformity in temperature and composition is not attainable in the furnace crucible.

To arrive at satisfactory information regarding the carbon content of the iron at the tuyere level, steel angles were driven into the burden through the tuyeres —the wind being shut off for the moment—and drops of molten metal caught in them. Repeated tests with gray and white irons indicated that the carbon content of the drops at this level varied from 0.10 to 3 per cent, showing that the absorption of carbon by the iron in the shaft and on the hearth of the furnaces is incomplete, and that additional carburization must take place below the tuyere level.

Total Carbon Dependent on Silicon Content and Temperature

A large series of tests was required to give information on the relation of total carbon content to furnace operation as, under normal running conditions on the part of the furnace, the variation in total carbon is but slight. An arrangement of the taps of equal temperature and equal silicon content give curves which plainly show the total carbon to be dependent upon these. As the silicon rises, the total carbon drops, and with equal silicon values the total carbon varies—rising as the temperature of the tap goes up.

Curves are given for basic, hematite ore, and for foundry pig irons, showing very regular curves in illustration of these tendencies. It is understood, of course, that with considerable variations in the other elements in the iron, there would be some distortion of the curves. For instance, an increase in phosphorus sends the total carbon down. Thus, Luxemburg (high phosphorus) pig iron averages 3.6 per cent total carbon, whereas other, lower phosphorus ore foundry irons run from 3.8 to 4.2 per cent total carbon.

The connection between total carbon content, chemical composition and metal temperature is easily understood when the process of carbon absorption is considered as a simple solution. With very high furnace temperatures, the saturation point as to carbon may be reached right in the zone of combustion, and as this saturated metal drops down into the cooler crucible, part of the carbon may separate out at the bottom of the crucible as kish. Any iron in the crucible which may not be saturated will then take up this kish for the purpose. Slags rich in iron oxides prevent this saturation with carbon and yield a lower total carbon pig iron, and upset the relation of carbon to tapping temperature.

Lower Crucible Temperatures Mean Lower Carbon

The investigations gave strong proof of the interrelation between furnace operating conditions and total carbon results. Any reaction which meant lower crucible temperatures promptly lowered the total carbon of the iron tapped. Actual temperature reductions in the furnace crucible were brought about purposely to test this out. This action is, however, an indirect one. Thus, forcing the ore-reduction process consumes more sensible heat and hence lowers the crucible temperature, which in turn lowers the absorption of carbon.

Also, some of the absorbed carbon in the iron is used up for reduction purposes. Similarly, the curves obtained on the relation of blast temperature and speed of furnace operation showed no direct connection between these and the total carbon results, though the curves were very regular in character.

Proper Course to Follow

Concluding with the importance of being able to make a low total carbon pig iron, the author states that his investigations indicated the proper course to follow. Since the total carbon content of the iron is determined by the kind of slag produced and the temperature conditions of the furnace, to get low carbon it is necessary to run slags richer in silica and iron oxide, and with lower temperature ranges. The crucible temperature will consequently drop and the result desired obtained while still getting high silicon ranges. Wuest and Brassert have already pointed this out also. Using refractory ores and pushing the furnace, as well as cutting the coke and running with lower blast temperatures will help in cutting the total carbon content, though within comparatively limited amounts.

Prepared from the German by Dr. Richard Moldenke with comments.

Finished Steel in World Exports

Gains in Bars, Wire and Tin Plate Tend to Offset Heavy Tonnage Losses in Rails, Shapes and Pig Iron—Sheet Products Form Backbone of American Trade

BY PAUL M. TYLER*

BETWEEN 1913 and 1925, although production increased 17 per cent, the total trade of the world and its total population both increased only 5 per cent. These figures, computed by the League of Nations, were heavily weighted for agricultural production, but a study of iron and steel bears out even more forcefully the conclusion that world trade has not kept step with world production. Each country has become more nearly self-contained. Intense nationalism, new tariff policies, and a dislocation of the old-established credit machinery have combined to cause raw materials to be worked up, wherever possible, at their source. High freight rates and the interruption of normal business during the war contributed toward the same end.

The causes for this condition are of no particular importance. What matters is that the world today has a great surplus of steel-making capacity. Changes have been wrought in the character of world trade. Competition, in so far as it is not tempered by international understandings, is keener. Henceforth, in export even more than in domestic selling, steel must be considered in the light of the service it renders. Millmen and salesmen think naturally in tons and the trade experts, most of them, are content to copy gross tonnage figures for imports and exports as representing the state of trade.

But the buyers of steel, those whom the steel serves, think specifically in terms of 120-lb. rails, welding rod, or, maybe, auger-bit stock. Recognizing that foreign markets now are definitely buyers' markets and that the world trade is an aggregate of special demands, the purpose of the present article is to analyze, according to major items, the combined exports of the six nations which together furnish more than nine-tenths of the total world exports of iron and steel.

The accompanying tables, since they are compiled from official figures of the respective countries, can be no more accurate than the original statistics. Different groupings are adopted by different countries and even in different reports of the same country for the same year. Skelp, for example, is included sometimes with pipe, sometimes with bars, and sometimes with semi-finished steel. Light structural material, similarly, may be grouped either with merchant bars or with girders and other shapes. Wire rods, since they are rarely separated from wire, are perforce mostly included under the latter category, along with nails, bolts, and, sometimes, nuts and screws.

Notwithstanding these numerous minor compromises, the accompanying data are offered as the best rough-and-ready index so far available for revealing general trends. Especially for such leading items as rails, shapes and sheets, the figures are reasonably exact although, even in the case of rails, splice bars are included in some countries with rails and in others with steel sleepers, which, along with wheels, axles, etc., are mostly included in the present tabulations under "sundries." Scrap exports, since they may always be segregated, have been omitted in all cases.

All the figures relate to gross exports and hence do not take account of the imports into the same countries under the specified categories. Where this situation seems to cause confusion, or where the same tonnage may be counted twice, once as exports from one of the leading countries to another, and again as exports from the second country, attention will be called to the fact in the discussion of the individual items.

Declines in Pig Iron and Alloys

Examining the statistics in Table I for the leading countries, we first find a drop in the exports of pig iron and ferroalloys from over 200,000 tons monthly in 1913 to only 138,000 tons in 1925-26. This falling off has been partly offset by an increase in the exports from British India (which have grown meanwhile from under 7000 to as much as 35,000 tons monthly), and by a small increase in shipments from China to Japan. Not so long ago, the Netherlands began to export pig iron, and Sweden (whose exports, normally some 15,000 tons a month, consist chiefly of high-grade charcoal iron), is also of considerable significance.

Actually pig iron, commonly as ballast, appears in some quantity in the exports of almost every country of the world. But since, even in the aggregate, these minor shipments are not large, they do not alter the fact that pig iron is of declining importance in international trade. If the United States, formerly a consistent exporter, had not imported really important tonnages in 1925 and 1926, the decline would appear even greater.

The reason for this state of affairs is simple: Pig iron is too heavy to go far. As soon as the tonnage requirements of a country or of a part of a country are large enough to justify it, local production tends to spring up. Coal and iron ore are fairly widely distributed and, even though natural conditions are far less favorable in many new producing countries than in older centers, almost every one of these new plants appears able to hold its own within the short radius of its local markets—often without the added help of a protective tariff which, notably in several British dependencies, has been generally forthcoming.

Without elaborating further on the general subject of transportation, it may now be stated that the trade in pig iron is made up principally of (1) shipments from one part to another of Europe; (2) imports along the seaboard of the United States; and (3) imports (chiefly from China and India) for supplying Japanese steel works. The scattered requirements of the rest of the world would not keep even one modern furnace in blast for more than a few months of the year.

Moreover, foundrymen all over the world are coming to buy pig iron not so much by brand as by analysis. They are buying the cheapest iron they can get, mixing different irons and scrap, if they see fit, to obtain the desired results. It follows then that no great quantity of iron can be carried a long distance unless it can be delivered cheaper than that made

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nearby. At the same time, substitutes for cast iron, notably lighter sections of steel, have kept down the demand for foundry iron, and the extensive use of scrap has substantially reduced the gross exports of iron for making steel.

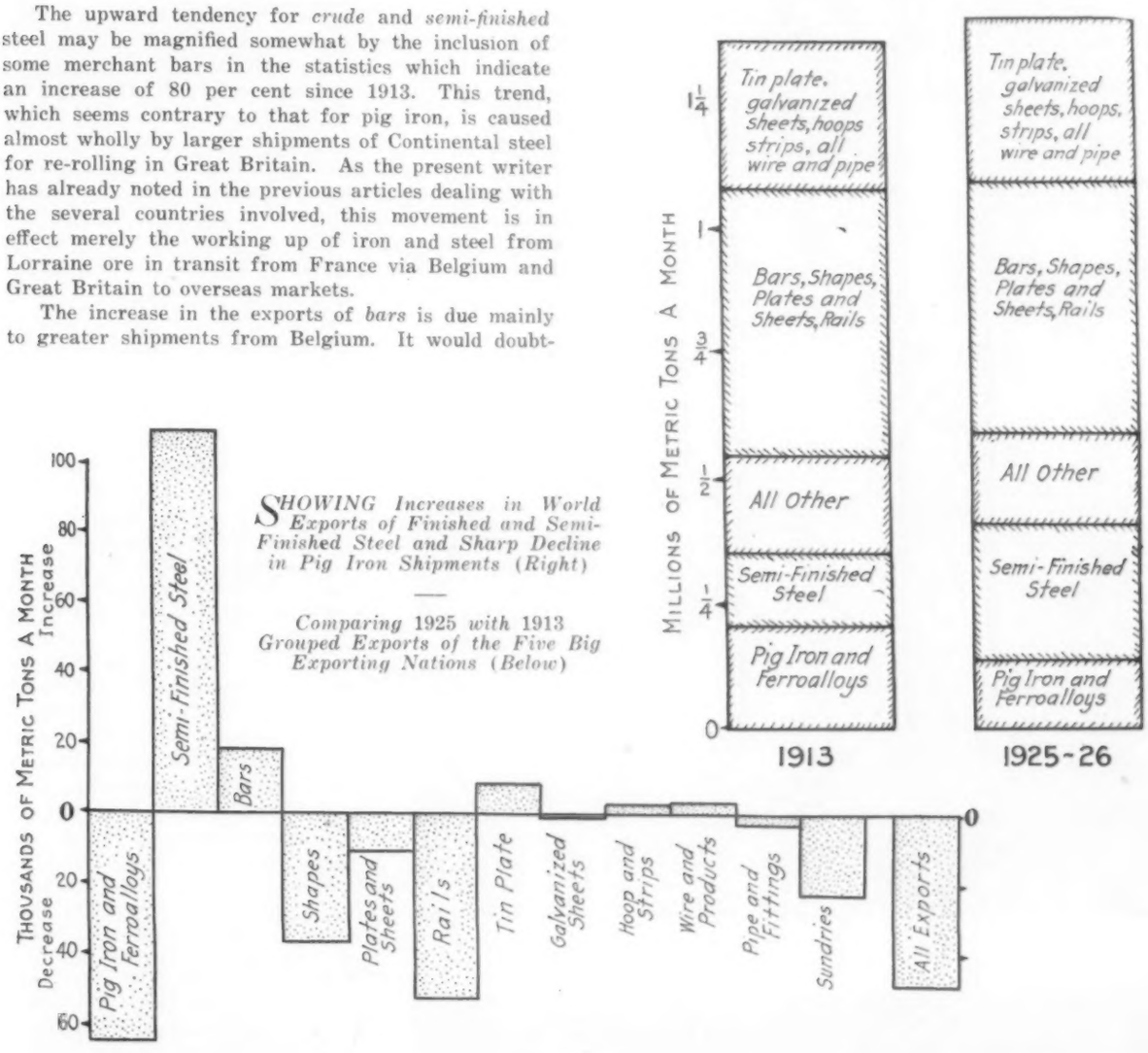
Even the movement of ferroalloys—never a large tonnage proposition—has fallen off because the development of ferromanganese industries in the United States and Canada has reduced the exports from England more than enough to offset the increases from Norway. Even France is exporting less alloys now than before the war.

More Semi-Finished Steel

The upward tendency for *crude* and *semi-finished* steel may be magnified somewhat by the inclusion of some merchant bars in the statistics which indicate an increase of 80 per cent since 1913. This trend, which seems contrary to that for pig iron, is caused almost wholly by larger shipments of Continental steel for re-rolling in Great Britain. As the present writer has already noted in the previous articles dealing with the several countries involved, this movement is in effect merely the working up of iron and steel from Lorraine ore in transit from France via Belgium and Great Britain to overseas markets.

The increase in the exports of *bars* is due mainly to greater shipments from Belgium. It would doubtless appear even larger if the increased exports from France could be separated from those of ingots, billets, etc., with which they are officially reported. Concrete reinforcing bars have become of great importance; consumption is said to have trebled in the last 15 years. Since, even in markets where they are not chosen for machinery or shop work (or for other services requiring resistance to shock), Thomas bars are commonly considered good enough for ordinary construction work, there is no mystery about the growing trade in French and Belgian bars, even while exports from both the United States and Great Britain have fallen off. The latter countries have themselves been importing increasing tonnages of Belgian bars because they are so much cheaper than their own products.

Since angles and other light sections often are included with bars, the category for *shapes* represents chiefly beams, girders and other heavy structural steel, mostly unfabricated. American exports have fallen off markedly, and British shipments had been reduced by one-half, even before the coal strike which placed England on an import basis. Exports from France and Belgium have increased, but not enough to make up for German losses resulting from the transfer of the mills in Lorraine. In short, the building boom, while it has been almost world-wide, has not called for heavy steel except in countries which make the steel themselves. Since steel frame buildings have withstood the earthquakes better than other types of construction, Japan has been buying considerably more structural material than formerly. But the gain from this source fails to balance the reduced imports into India and Australia, where local production supplies more and more of the demand. In 1926, all the Continental countries registered a sharp increase in exports of both plain and fabricated building material.



Hoops and strips form another classification that is not too definite. Cotton ties and barrel hoops are two important items for which the United Kingdom dominates the trade, including the baling of jute in India and of cotton in various parts of the world. The substantial increase under this general head, however, is attributable mainly to France, Belgium and the United States. The movement consists partly of band iron and partly of fairly heavy flat steel which commonly falls into the same classification.

Likewise included in this category are numerous specialties, such as band-saw steel, safety-razor blade stock, steel for making steel tapes, and other flat wires, both hot- and cold-rolled. The production of wide strips to compete with sheets seems so far to be mainly

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Ventilating System, Materials Handling Methods

Fig. 1

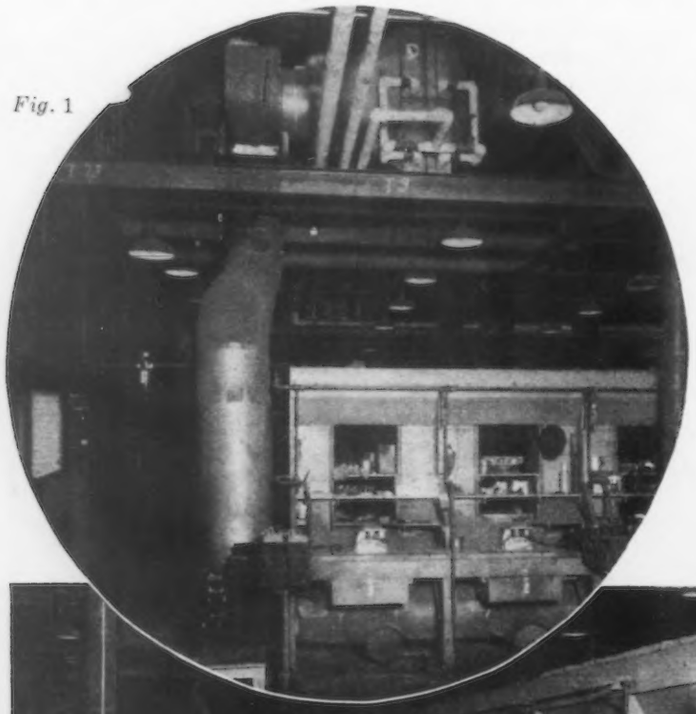

Fig. 2

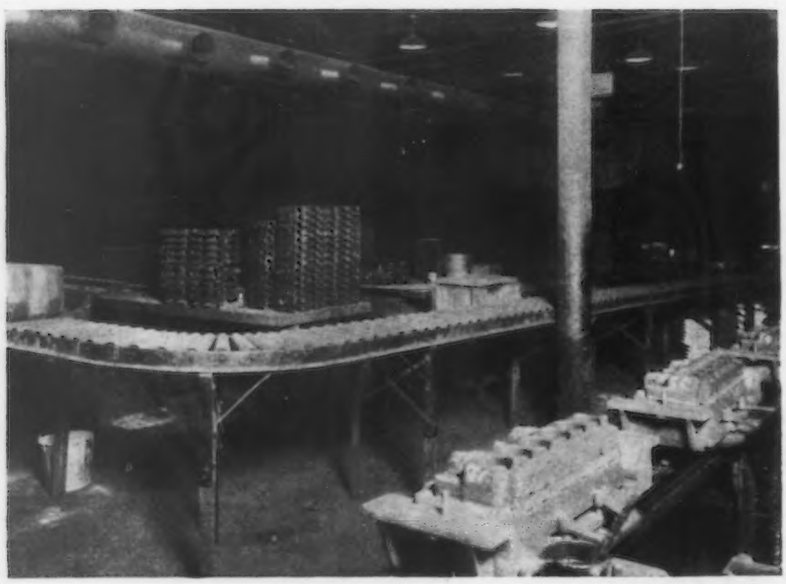

Fig. 3

AS any plant progresses and its output increases it is necessary to change methods of operation so as to take care of the gain in production without adding to costs and, if possible, at lower costs. The core room in the foundry of the Packard Motor Car Co., Detroit, has undergone several rearrangements in the last 20 years, and the most recent has just been completed. A previous article described the system for taking care of the incoming sand and for mixing core sand, and this one will treat the coremaking problems proper.

The core room is located between the gray iron foundry on one side and the aluminum foundry on the other. At the back of the core room, connection with the outside is almost entirely shut off by sand bins and a sand mixing system, and at the front a general service building, which contains the pattern shop, offices and other departments, cuts it off. As a consequence, proper ventilation is important. To take care of this it was necessary to provide an indirect system which would give a slight excess of air in the core department and sweep out any smoke that might come in from either one of the foundries.

A good idea of the ventilation system may be gained from Fig. 1, which shows one end of a double set of coremakers' benches, with one of a number of unit heaters and blowers located above it. The ventilating system takes air from outdoors, heats it and blows it down into a pipe under the coremakers' benches, where it comes out through openings near the floor line. By properly adjusting the dampers on these pipes the best distribution of air is obtained. In summer the same system is used for ventilation without the heaters.

Fig. 2 shows a series of coremakers' benches that serve roll-over coremaking machines. Jacket cores and similar pieces have a large number of wires and rods in them and a relatively small amount of sand compared with the bulk of the core, and for this reason convenience in manipulation is of more importance than special methods for the introduction of sand. As shown in the illustration, the machines are arranged in front of the core benches, and the core benches serve to take care of rods, wires, driers, chills and other pieces necessary in coremaking. At the same time sand is supplied from a sand hopper at one end of the core benches, the sand being

and Layout are Features of Packard Core Room

put into the core box by means of a scoop or shovel.

As pointed out in the previous article, these benches are supplied with sand from overhead. Incidentally, this illustration shows an interesting point in regard to photography. A numbered tag is used for indicating the kind of sand used on each bench, and the background of each tag is a different color so that the operator can tell the kind of sand required, both by the number itself and the color. The tags with the blue background show white so that the numbers on them are not visible in the picture.

The cores are placed on racks, as shown in Figs. 1 and 2, and electric lift trucks take them to standard rack-type core ovens furnished by Holcroft & Co., Detroit, each oven taking two racks. The dried cores are then taken from the ovens to a cooling floor and later to the inspection and cleaning floor. A general view of a portion of the floor for the inspection and cleaning of cores for cylinders is shown in Fig. 3. From the racks, which are arranged along the back of the floor, the operators take off the cores, returning the plates and driers. They then inspect and prepare the cores for blacking. Finally, the cores pass down gravity carriers to a continuous drying oven.

In the immediate right foreground of Fig. 3 is shown a portion of the pasting and assembly conveyor used for making up the cylinder jacket assembly. Fig. 4 shows a more detailed view of the jacket assembly layout. On the right is a series of benches with pasting troughs at which the men work while making the assembly. The cores are delivered to the men by gravity carriers, and each operator performs one or more operations in the assembly line. Above the benches can be seen test jigs used in making up the assembly. When the core assembly is complete, it is taken off and placed in the vertical, gas-fired, continuous drying oven shown in the rear.

The continuous drying oven referred to has two uses. First, it serves to dry all blackened cores on their way from the cleaning department to the assembly, and, second, it dries the paste in the assembled cores.

Fig. 5 shows the discharge side of the drying unit. The cleaned and blacked cores ready for assembly pass to the left of the oven where the jacket assembly is made, while the pasted jacket assemblies come out of the oven and are passed directly toward the front of the picture down a gravity carrier. In the immediate foreground there is a grinding rig for facing the assembly and certain other cores. The assembly then passes to the left on a gravity carrier, as indicated. The cylinder pouring molding floor is only a few feet from this location, and the assemblies and other cores necessary for this floor have to be transported but a few feet to their point of use. The other cores are placed on special trucks and transported to the molding units where they are required.

The H. M. Lane Co., Detroit, acted as consulting foundry engineer in connection with the work, and the installation itself was carried out by the Packard Motor Car Co.'s construction division.

Fig. 4

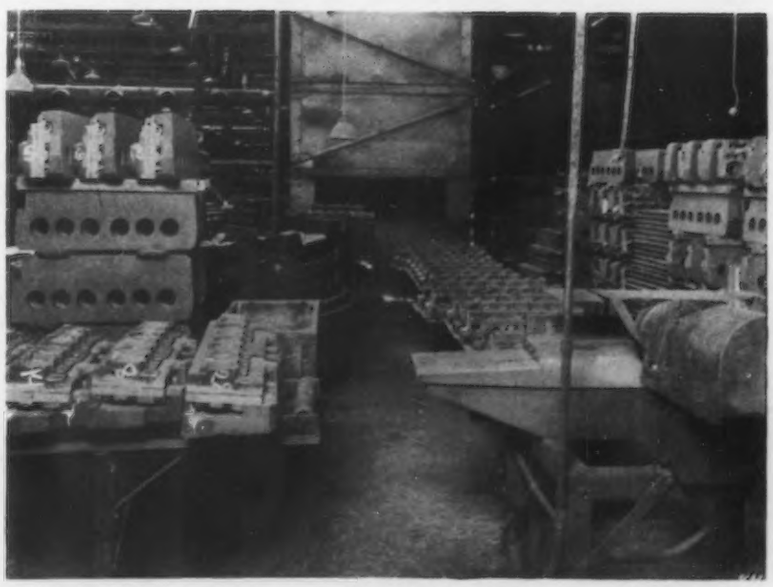

Fig. 5

Iron and Steel Centers in France

What Are the Conflicting Factors Which Have Governed Development of the Various Districts

BY ANDRE J. REYNAUD*

IRON and steel as an industry in France is as old as the nation. In his "Gallic Wars" Julius Caesar refers to the remarkable properties of some small torrents in the Alps for the quenching of swords and many French towns contain "ferriere" in their names, or "la ferriere," evidently derived from the Latin word *ferrum*.

The writer was born in Allevard, a small town in the French Alps, where there is a steel mill still in operation that claims to be one of the oldest in the world. This mill, which had been operating for a long time at the beginning of the thirteenth century, has continued uninterruptedly to the present day. The iron workers in France were always highly regarded men, proud of their work and their skill, which was taught by father to son. Metallurgy was one of the very few trades that a nobleman could practice without forfeiture of his nobility; in fact, some of the oldest names in France are those of families raised to nobility in consideration of the service rendered to the country by improvement of some metallurgical operation, or an increase in the efficiency of their mill.

The first iron works, or "forges," were established at places near fuel and water, the two essential factors. Ore could be shipped to the plant easier than fuel and swift torrents were necessary to supply the required power. Conversion of raw metal into the finished article was done entirely under hammers, operated by the running water against a wheel connected with the hammer through shaft and eccentric. The fuel was at first almost entirely wood. These two facts explain why the Alps were the starting point of the iron industry, as wood and water were plentiful and in addition there were some fairly large deposits of iron ore (siderite, iron carbonate, Fe CO_3) which were very easy to work.

Industry Shifts to Coal Centers

With the development of the use of coal and the destruction of the forests, the iron industry moved to other sections. As early as the fifteenth century, the great metallurgical center of France was the St. Etienne district, in the center of the country, but it was not until after several centuries that the iron and steel industry came back to the place of its birth, the French Alps.

During the past 25 years, in the old plant of Allevard (Société des Hauts Fourneaux et Forges d'Allevard) in particular, the electric furnace was developed and improved and the same torrents which formerly turned the wooden wheels for the blacksmith's hammer are now generating hydroelectrically the energy required by plants employing several thousand workers.

Three factors have influenced the location of modern French steel plants; coal mines, ore deposits and proximity to the seacoast, so that ore can be brought from North Africa and coal from England. The mills thus built near the sea were of great assistance during the war, when the industrial regions of the North and East were under German control.

The most important metallurgical districts of France are: The Center, built on an old coal deposit, known and worked since the fifteenth century (mills specialize in high quality products); the North, built on the French-Belgian coal deposit, the largest in the country (ore is brought from the East); the East, the most important district, established on an ore deposit and obtaining most of its coal from Germany, which is not more than 50 or 60 miles distant. Some extremely good coal is found also in Lorraine and the Saar district.

Aside from these three districts, France has some steel mills built on the ore deposits in Normandy, which use British coal. In the Southwest also are a few plants using British coal, their ore coming from Spain or the Pyrenees. In the South there are some steel plants on the Alais coal deposit, using Algerian and Tunisian ore, but the tonnage produced by these other districts is unimportant in comparison with the large capacity of the East and the North.

Alloy and Special Steels Made in Center

Despite the small tonnage of steel produced in the Center district, it is of great interest to the metallurgist. Since early in the fifteenth century, the entire district has been populated by thousands of iron workers, blacksmiths, cutlers and weapon makers. Small iron ore deposits supplied the metal, and near to the surface an extremely good coal was mined, suitable for forging purposes. The small rivers, like Le Gier and Le Furens, supplied the power for the small hammers then in use. The activity of this district was amazing and for many centuries it was the great industrial center of the country. Its position in France is comparable to Sheffield in England.

It was in this section that the first French railroad was built; here also the open-hearth process was developed by the Martin brothers, and it was here that chromium and chromium steels were first made. Many names linked with this district, such as Le Creusot, St. Chamond, Firminy and St. Etienne, are familiar to metallurgists the world over.

About 100 years ago, the French-Belgian coal deposit was discovered. Meanwhile, most of the good coal had been removed from the mines which had been worked for the previous 400 years and, with the defective methods used in early mining, working of the old deposits became more and more difficult. Consequently the heavy tonnage mills, making rails, structural shapes and plates, gradually shifted to the north of France, where the coal was better and cheaper.

The steel mills of the Center have had to face a serious problem, in addition to high priced coal and the difficulties in working the mines. More and more, the Paris district became the greatest consuming center and Paris is far from St. Etienne. Besides the district is hemmed in by mountains, which present a serious obstacle to the building of fast freight lines to connect with Paris. Local consumption is small and, since the ore mines have been exhausted for some time, ore and scrap must be shipped from distant points. However, some aid to the industry of this district has been given by the Government, which, for military reasons, does not wish to have all the steel industry concentrated in the North or the East, where the frontier is open. The national munition plants are mostly in the Center district.

Output is Open-Hearth, Electric and Crucible Steel

Another reason for the survival of this district as a steel center is that in the North and the East, where the Bessemer converters can turn out thousands of tons, quantity production is of utmost importance. In the Center, where freight is the big problem, only special quality material is made, products in which the

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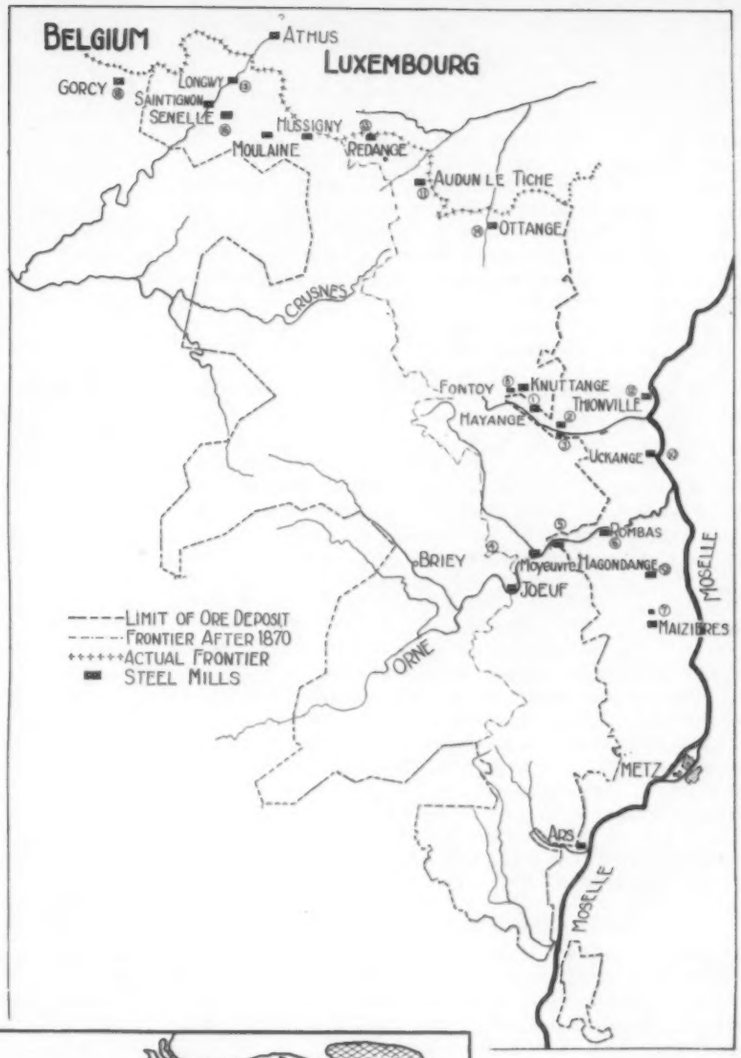
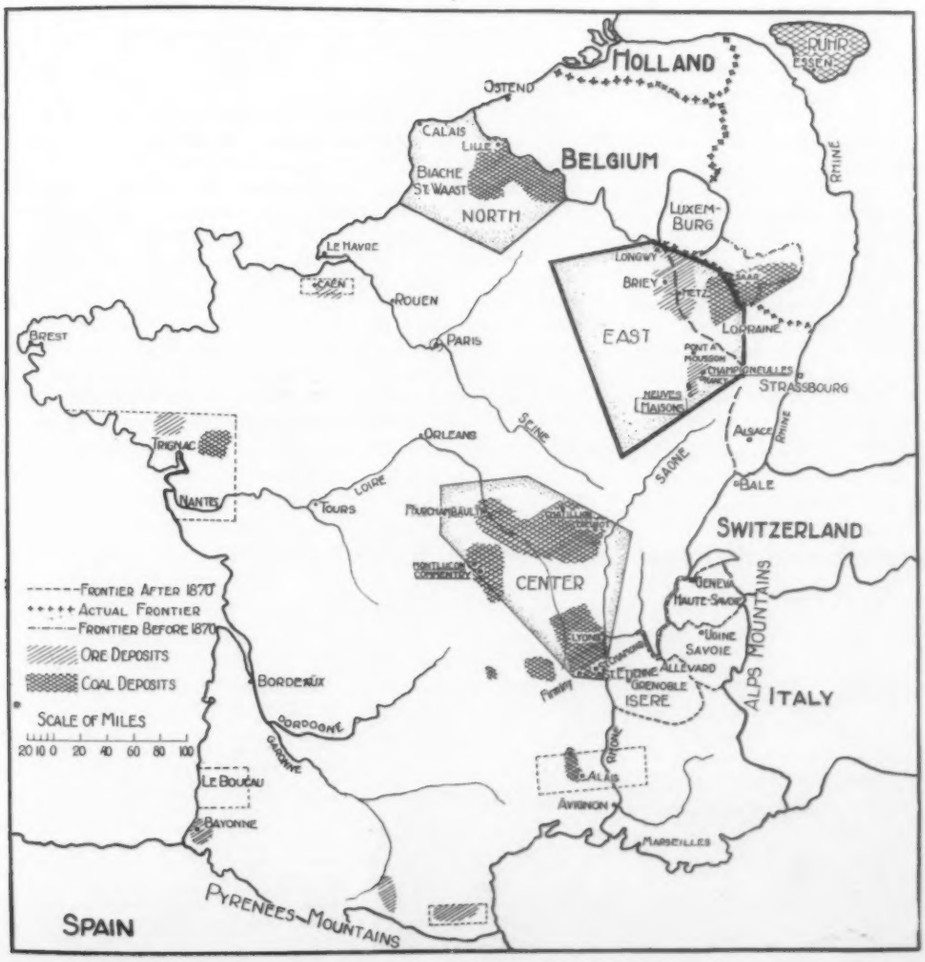
THE ore deposits shown are the Longwy and Briey districts. The mills in the Briey district are marked from Nos. 1 to 14, as follows: (1) *Hayange, 4 blast furnaces;* (2) *Patural, 6 blast furnaces, 4 converters and rolling mill;* (3) *Fenderie, 4 O. H. furnaces and rolling mill;* (4) *Moyeuvre, 8 blast furnaces, 4 converters, rolling mills;* (5) *Jamaille, rolling mill;* (6) *Rombas, 8 blast furnaces, 6 converters, 4 O. H. furnaces, 2 blooming mills, 10 trains of rolls;* (7) *Maiziers, 4 blast furnaces;* (8) *Knuttange, 10 blast furnaces, 6 converters, rolling mills;* (9) *Hagondange, 6 blast furnaces, 5 converters, 2 O. H. furnaces, 3 electric furnaces, 1 blooming mill, 4 trains of rolls;* (10) *Uckange, 6 blast furnaces;* (11) *Andun le Tiche, 4 blast furnaces;* (12) *Thionville, 4 blast furnaces;* (13) *Redange, 3 blast furnaces;* (14) *Ottange, 3 blast furnaces.*

The plants in the Longwy district are marked from Nos. 15 to 18 as follows: (15) *Longwy, 9 blast furnaces, 6 converters, 5 O. H. furnaces, 14 trains of rolls;* (16) *Senelles-Maubeuge, 7 blast furnaces, 1 Talbot-Martin (200 tons), O. H. furnaces, converters and 14 trains of rolls;* (17) *Hussigny, 2 blast furnaces;* (18) *Gorcy, 4 blast furnaces, O. H. furnace, converters.*





THE three great industrial districts of France with iron ore and coal deposits marked are shown in the shaded sections of the map. The intense concentration of industry in the East district is particularly great in the Longwy section, which is about 20 by 40 miles in area and embraces 18 groups of plants with a total of 94 blast furnaces.

The Center district, bordering on the French Alps, was the first location of the French iron and steel industry. Outside of these districts are a few mills in Normandy and a few in the South and Southwest.

cost of workmanship occupies the most important place. Rails and shapes are not made, but instead the mills specialize in crucible, electric furnace and acid or basic open-hearth alloy steel.

Most of the old firms in the district have purchased or erected tonnage mills in the North and East, but still keep their old plants running on special steel. The most important of these mills are: Le Creusot, which belongs to Schneider & Co.; St. Chamond, owned by the Acierie de la Marine; Unieux, controlled by the Soc. Anon. des Etablissements Jacob Holtzer; Imphy; Montlucon and Commentry, owned by the Compagnie des Forges de Chatillon-Commentry at Neuves-Maisons. There are also the Soc. Anon. des Acieries et Forges de Firminy, producing alloy steel and malleable iron, Soc. Anon. de Commentry-Fourchambault et Decazeville and the Forges de Gueugnon.

Of these plants, the Creusot works produces semi-finished and finished rolled or forged products, guns, munitions, electrical equipment, steam engines and other products. During the war an open-hearth plant was built near the Creusot plant at Le Breuil. This shop, with eight 60-ton furnaces, is one of the largest open-hearth plants in France. The St. Chamond plant of the Compagnie des Forges et Acieries de la Marine produces special quality open-hearth steel. The same company has two large works in the East at Homecourt and Rombas. The Unieux plant of the Jacob Holtzer interests has a capacity of 2000 tons a month, principally of crucible steel, including some high grade tool steel. The Imphy works also specializes in open-hearth and crucible production.

The Montlucon and Commentry plants are about 10 miles apart. The big production mill of the company is at Neuves-Maisons, and it is interesting to add Armco ingot iron is now made in France at this company's plants. At Commentry, rolled products and tin plate are produced from the steel made at Montlucon in the open-hearth electric furnaces and crucibles.

Large Steel Consumers in North

Because of the large coal deposits, the north of France is a very active district. In this section are some of the largest steel mills and many steel consuming industries, such as locomotive and car builders, machinery and equipment manufacturers, as well as some of the largest chemical plants in Europe. The steel mills are almost entirely large production units, making rails, structural shapes and heavy sheets or plates.

The most important of these mills in the north are the Soc. Anon. des Hauts Fourneaux, Forges et Acieries de Denain et D'Anzin, with blast furnaces, converters, open-hearth furnaces and rolling mills, a total production of about 400,000 tons of steel and 300,000 tons of pig iron annually; the Soc. Anon. des Laminoirs, Hauts Forneaux, Forges, Fonderies et Usines de la Providence, with blast furnaces, converters and open-hearth furnaces and specializing in cast iron and cast steel; the Douai works of the Etablissements Arbel, with open-hearth furnaces, rolling mills and forging equipment; Soc. Anon. Metallurgique D'Hautmont; Soc. Anon. des Forges et Acieries du Nord et de L'Est; Soc. Anon. des Acieries de Paris et d'Outreau; Soc. Anon. D'Escaut et Meuse; and the Soc. Anon. des Fonderies Laminoirs et Ateliers de Biache St. Vaast, in the Pas-de-Calais.

All the plants and mines in this district were damaged and some partially or entirely destroyed during the war, so that they are just beginning now to operate normally.

Largest District in the East

The position of France as one of the great steel producing nations of the world is largely due to the East district. For a long time the ore deposits in Lorraine were known, but prior to 1878 nobody had been able to produce good iron from this ore. The old iron workers called it "minette," diminutive for mine, as an expression of contempt for this low grade ore. After the war of 1870 Germany took the rich plain of Alsace, but left to France the greater part of the iron ore. A few years later, Thomas and Gilchrist, two young Englishmen living in Paris, developed the basic Bessemer process, and this ore deposit, previously unexploited, became at once one of the most valuable in the world.

The ore is on the surface and easy to work, so that such quantities can be extracted that it supplies not only France but also the greater part of the British and German industry. Boats can be loaded near the mines and the ore shipped by water to the Ruhr and to Welsh furnaces. Under present conditions more than 20,000,000 tons a year can be extracted.

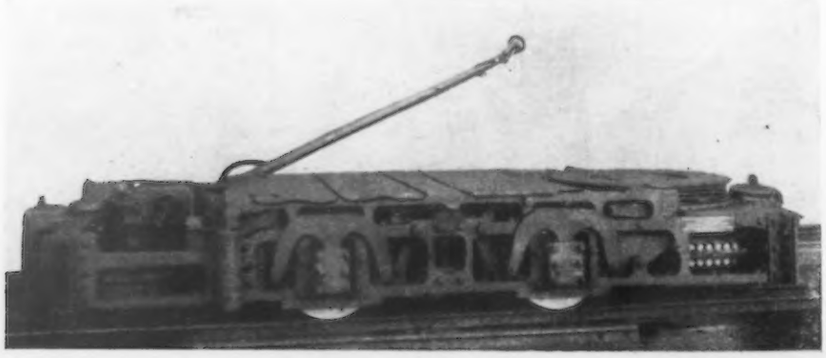
Since the war France has recovered all of this deposit and part of the coal mines. Some coal is mined in Lorraine, but the tonnage of coke produced there is insufficient to supply the demand, so that most of the fuel has to be purchased elsewhere. The logical place is the Ruhr, from which it can be easily shipped by river to Lorraine.

Fifty years ago there were only a few small plants in this region, but the recent industrial development is extensive. The high phosphorus content of the ore is becoming less of an objection in the quality of the steel and it has been found that the high phosphorus pig iron is easy to melt in the basic converter, as the phosphorus, by burning, supplies much of the heat required to keep the metal molten. In addition, the phosphoric acid in the slag gives it a high commercial value as fertilizer.

One district, especially interesting, is formed by the three provinces of Savoie, Haute Savoie and Isere. There is neither coal nor ore in this section, and the transportation is difficult, but this district, which is in the Alps, has an abundance of "white coal" or hydro-electric power. This cheap electricity is used in the Southeast by various industries and in the Alps for electric furnace production of electric sheets, ferro-manganese, ferrochromium and other ferroalloys.

The plant of the Compagnie des Forges et Acieries Electriques, Paul Girod at Ugine in Savoie is an example of what electricity can do in a steel mill. In this plant, which operates nine electric furnaces, four rolling mills and considerable forging equipment, there is not a single boiler. The torrents nearby supply all the power for heating the furnaces, driving the mills and producing compressed air for the press and hammers.

Lowest and Slowest Locomotive Ever Built



THE 4-ton gathering locomotive here illustrated is mentioned as the lowest and slowest of this type ever built. It meets the demand for motive power for working thin seams in mines. It has an overall height of 23½ in. and speeds of 2¼ miles an hour when operating from conductor cable and 6 miles an hour when operating from the trolley. It was shown in the Baldwin-Westinghouse mine locomotives exhibit at the recent American Mining Congress. Some of the features of its design include semi-magnetic control, bar-steel frames, self-equalizing coil springs and ball bearing motors. One of these locomotives with drum type control is now used by the Erskine Coal Co., Staunton, Va.

Reversing Blooming Mill Practice

Drafts for Heavy Ingots—Small-Diameter Rolls for Proper Economy—Proportioning of Roll Passes

BY GEORGE A. V. RUSSELL

INCREASING the unit weight of ingots reduces the cost of steel in ingot form, by reduction in handling costs and ingot-mold consumption. This may be said to hold good for all ingot weights likely to be employed in "tonnage" plants. It is not so certain that heavy ingots produce better or even as good quality finished products. But it is probable that some comparisons made in the past, when the fundamental importance of casting conditions and mold proportions were less realized than nowadays, have tended to obscure the issue.

In view of the tendency toward casting heavier ingots, it is necessary to examine more closely the effect of this tendency on blooming-mill practice. The use of heavier ingots entails a heavier and more expensive plant and greater maximum capacity of the driving unit. This results in increased capital cost, and consequently higher standing charges, whose incidence can be lessened only by a greater output. Therefore, unless a large market exists for the products of the mill, acting as a powerful inducement to raising its output to the maximum, the more costly plant required for the heavier ingots tends to increase the overall rolling costs.

Large Ingots Reduce Working Costs

On the operating side, however, any increase in the weight of ingot decreases the working costs by reducing the power used for auxiliary services, as well as for the main rolls. The proportion of usefully expended work to idle work increases as a result of the reduction in the number of reversals per ton, and of idle running at the ends of passes. It is thus evident that, with any given installation, the greatest efficiency will be attained when the heaviest ingots that the plant can deal with are employed.

Proportions of the ingot, important from the point of view of quality, are no less so from that of rolling efficiency. As the energy expended in cogging is a function of the elongation worked to, it is highly advantageous to cast ingots as long as possible in relation to their mean cross-section. Dr. C. Kiesselbach emphasized this point in an article in *Stahl und Eisen* in 1920. Table II gives the proportions of ingots used in some modern works, and shows the variation in the ratio of length to mean cross-sectional area.

Another important advantage which accrues from the use of heavier ingots is the reduction in the weight of crop ends produced per ton, and the consequent increased yield.

Blooming mills are occasionally called upon to do preliminary shaping of a heavy character, such as, for example, large beam blanks. There is at least one plant where a reversing blooming mill is regularly rolling large-, medium- and high-carbon rounds (12 in. to 18 in. diameter). These are subsequently sliced up by special rotary shears into disks for feeding rolled-steel-wheel mills. [See THE IRON AGE, Sept. 16, 1920, pages 704 to 710.]

Limits on Size of Bloom

With a modern heavy mill it is not generally speaking, an economic proposition to roll down to less than 6 in. square. No great proportion of its output should go into billets of smaller section. A few years ago 4 in. square was considered the limiting size for a large mill. Improvements recently made in design, although they have greatly increased the productive capacity of a plant, have likewise increased its capital cost, and so render its employment justifiable under conditions favorable to good efficiency.

It is possible to deform steel economically only with small rolls. That is, the ratio of the effective diameter of the rolls to the height of the piece should be as small as considerations of roll strength and engagement permit. The large rolls of a blooming mill obviously cannot fulfill these requirements over a wide range, so gradually the employment of a separate billet mill with smaller rolls has come into vogue.

Continuous Billet Mills

In the United States these billet mills are generally of the Morgan continuous type, taking 6-in. to 8-in. blooms from the blooming mill, and rolling them right off to any desired billet or slab section down to 2.25 sq. in. Without doubt the continuous mill is the most efficient means for the production of billets, when the available market is such that the mill can be operated at maximum capacity for a good percentage of the time.

Although the mechanical efficiency of the continuous mill is unavoidably poor, this is more than offset by the low energy consumption required for actual deformation, resulting from the small-diameter rolls used, the heavy drafts taken, the high rolling speeds, and the absence of handling between passes, reducing the temperature drop, even with small sections, to a minimum.

In Europe continuous billet mills have not, for one reason or another, made so much headway. But of late years their undoubted advantages under certain economic conditions have begun to be appreciated. The usual European billet mill is a two-high reversing unit with relatively large rolls, and is frequently driven by the engine or motor driving perhaps a heavy rail or section mill. Such mills are uneconomical in operation, and they should be employed only when a small tonnage of billets is all that is required.

Looping Blooming Mill

Mention should be made of an interesting method by which a heavy blooming mill was adapted to the production of billets as small as 1¾ in. square. This was developed by the Morgan Construction Co. for the Grand Crossing Tack Co. at Chicago in 1902. The method has more recently been adopted by the Keystone Steel & Wire Co., Peoria, Ill. In these two instances the ingot is rolled down to 4 in. square in the ordinary way and cropped. Then it is returned to the

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The author is manager of engineering department, Brightside Foundry & Engineering Co., Sheffield, England. The article is taken from his paper read before the American Society of Mechanical Engineers, at a local meeting in Cleveland. A previous portion of the paper appeared in THE IRON AGE of March 3, page 638.

mill (the latter being run non-reversing) and the billet is further reduced by the aid of circular or 360-deg. repeaters, which guide it successively into four grooves in the cogging rolls, and finally lead it away to the billet-shear conveyor.

This method of producing small billets, while employing a heavy blooming mill for the whole operation, permits the whole of a 2¼-ton ingot to be rolled into the section mentioned above with the least possible crop-end losses. It has proved a sound commercial proposition when only a small tonnage of such products is required. [It is illustrated and briefly described in THE IRON AGE of June 11, 1925, page 1707.]

Arrangement of Passes

In the proportions of the main rolls and in the arrangement of their gating, considerable divergencies between American and European practice are noticeable. In general the American practice is to keep down the length of the roll barrels to a minimum by having the least number of gates possible, and effecting the bulk of the reduction in "open" passes. The typical European method is to endeavor to roll in grooved passes, which naturally involves a good many more gates in the rolls and so increases their length.

Strength necessitates a considerably greater minimum diameter in the latter case to resist the increased bending moments and twisting strains. This entails greater power consumption per unit of deformation. It will probably be admitted that rolling in grooved passes produces more shapely blooms, which are easier to handle with the primitive types of manipulator employed in Europe. This accounts in some degree, no doubt, for the still common employment of large-diameter cogging rolls there.

Samples of American and European Design

In Fig. 2 are shown representative examples of typical rolls. *A* is a set of rolls for an 1120-mm. (44-in.) mill recently installed in Belgium. The comparatively short plain portion is used exclusively for rolling slabs, and never for the intermediate passes for blooms. The set shown at *B* is in contrast with the foregoing, and is just as typical of American practice. These rolls are for a 34-in. mill. The plain portion in the center of the barrels is long enough to take the widest slab the mill has to produce. The ingot, also, receives the early passes here, whether destined to be rolled into a bloom or a slab, its squareness of section being maintained solely by turning over. There are only three shallow grooves for those bloom and billet sections most frequently produced and also for edging slabs.

The strength of these rolls is much increased by their having the greatest diameter where the maximum bending moment occurs. A little detail worth noting about the bottom roll is the provision of small grooves cut in the end collars, which, in conjunction with suitable guards, effectively deflect scale from the necks.

The rolls shown in *C*, employed in a modern English 40-in. mill, represent a compromise in design between the two preceding examples. Here the grooves are in all cases shallow. The ingot enters in the widest gate, the second from the driven end, and is there given several passes before it is skidded over to the first gate. The last example, *D*, represents a set of rolls for one of the two rather unique American mills just mentioned, which roll down to as small as 1¾ in. square. In these rolls the ingot enters the right-hand gate and works progressively across the barrel until it leaves by the last diamond gate on the extreme left.

Table II—Proportions of Typical Ingots

Weight, Tons	Mean Cross-Section, In. × In.	Length, In.	Ratio of Mean Cross-Sectional Area to Length	Ratio of Mean Diameter to Length	Cu. In. per Ton
1.5	15 ×15	53	4.25	0.283	7,950
1.8	15 ×17	55	4.6	0.291	7,792
2.0	18.5 ×20.5	42	9.05	0.464	7,964
2.5	18 ×18	61	5.3	0.295	7,905
2.5	18 ×20	55	6.5	0.345	7,920
3.0	20.6 ×20.6	56	7.55	0.368	7,696
3.0	21.5 ×21.5	51	9.05	0.422	7,858
3.1	18.5 ×21.5	62	6.4	0.322	7,955
3.5	26 ×20.5	52	10.2	0.444	7,919
4.0	19.25 ×23.25	72	6.2	0.294	8,056
4.0	22 ×22	65	7.45	0.339	7,865
4.5	19 ×23	80	5.45	0.261	7,769
5.0	30 ×19	69	8.25	0.346	7,866
6.0	25.6 ×25.6	72	9.1	0.356	7,864
7.5	24 ×37.5	66	13.6	0.455	7,920
7.5	25 ×30	80	9.4	0.342	8,000
7.75	27.37 ×38.25	59	17.8	0.548	7,970
8.0	29 ×24.25	66	14.5	0.466	7,802
9.0	34 ×28	75	12.7	0.411	7,875

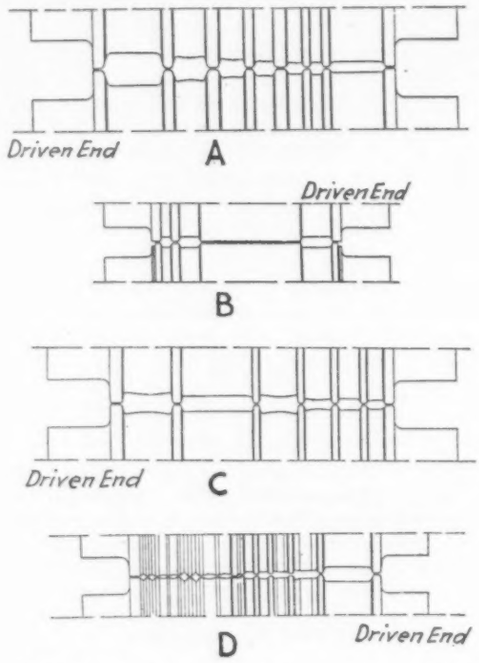


Fig. 2—Typical Roll Passes as Described in the Adjoining Column and Above the Cut

As a result of the repeater grooves, these rolls are considerably longer than is usual in the United States.

Groove Swelling Assists in Bloom Shaping

It will be noted that the larger grooves of the rolls *A*, *C* and *D* are swelled in the middle. This is an important aid in obtaining blooms of good appearance, as by forming a slight hollow in the walls of the bloom it assists the latter to sit properly on the table rollers, and thus tends to prevent twisting on entering a gate. The taper on the sides of the collars should be ample not only to assist stripping but to allow economical dressing up. If the collars are deep, those coming behind the steps in the breast roll should be thickened up to allow relative adjustment of the rolls and breast roller as wear takes place.

Roughening of blooming-mill rolls plays a considerable part in rolling by facilitating engagement of the piece when heavy drafts are taken. The arrangement of the roughening grooves is not of great moment, otherwise than for the appearance of the bloom, but their form is important if surface laps are to be avoided. The grooving should be relatively shallow and the junction between the grooves and the periphery of the roll should be liberally radiused. Any tendency for the projections rolled into the piece to fold over is thereby greatly diminished.

Steel Replaces Iron for Rolls

Blooming-mill rolls are now generally steel castings or forgings, as cast iron rolls do not possess a sufficient factor of safety to warrant their employment under

severe conditions. Dr. Puppe's investigations on roll-neck pressures showed that stresses of over 6000 lb. per sq. in. are attained when taking moderate drafts on well-heated material. This figure is probably exceeded frequently in every-day work. In German practice steel with a carbon content of 0.25 to 0.35 per cent is employed but in the United States harder material, with between 0.5 and 0.6 per cent carbon, is usually used for blooming rolls. Such rolls can be relied on to turn out about 80,000 tons on the average. To equalize the stress in the two rolls, it is advantageous to give the bottom roll a slightly greater diameter than its mate.

In general it is desirable to make the first few passes light, until the ingot has been compressed on all four sides. This is to make sure that it has solidified sufficiently to provide an outer envelope strong enough to withstand the greater pressures subsequently applied, and further to reduce the liability for corner cracks to develop on the yet unworked sides. Some experimental work on the arrangement of the drafting at the three-high blooming stand of the South Chicago rail mill a few years ago demonstrated the influence of moderate early drafts in reducing the percentage of second-quality rails produced. After these first gentle reductions the drafts should be increased to the maximum the mill can pull, to take advantage of the heat in the bloom. As the desired final section is approached the drafts are eased off again, as the piece will then be commencing to cool more rapidly.

Tin Supply for American Consumers

Increase in World Output Depends on New Mining and Smelting Methods — The Cure for High Prices — How Metal Is Used in United States

BY C. L. MANTELL*

THE economic situation of the United States in respect to tin is somewhat analogous to that of rubber.

World Output and American Consumption of Tin

The world's annual production of tin metal is approximately 144,000 gross tons, of which the United States imports and consumes more than 77,000 tons, or about 53 per cent. This tin metal is valued at nearly $105,000,000. The following table gives the chief producers of tin for 1926 in tons and the figures are for ore calculated to a metal basis:

Federated Malay States	45,946
Non-Federated Malay States	2,220
Bolivia	32,113
Dutch East Indies	33,006
China	6,800
Siam	6,978
Nigeria	7,042
Australia	2,700
Cornwall, England	2,064
Union of South Africa	1,107
Other countries in the world excepting the United States	3,546
United States (Alaska)	12

These represent primary tin. Secondary tin recovered in various forms amounts to approximately 28,000 gross tons per year in the United States. American consumers thus take annually about 105,000 tons of tin. Its primary tin production is quite negligible.

The United States imports no tin ore (except a few tons now and then for experimental purposes) and it has no commercial tin smelters. Several such smelters were operating during the war, but were driven out of the field by English competition and cheaper English labor.

How Tin Is Used in United States

About 38 per cent of the tin consumed in this country goes into the manufacture of tin plate. It contains from 1.5 to 1.7 per cent of tin. America has often been termed the home of the tin can where it is estimated that we consume and destroy a can per person per day throughout the year in our consumption of canned food products alone. The value of tin ware produced in the United States in 1925 was $260,359,961, the production of some 240 plants.

America has more automobiles than any other country in the world. We consume an average of 7.5 lb. of tin per car produced.

Nearly 90 per cent of the American consumption goes into four main channels: Tin and terne plate, solder, babbitt, and brasses and bronzes. About 35,000 tons are used for tin and terne plate. Sixty per cent or more of this tin plate goes into tin cans. More than 28,000 tons enter into solder manufacture, an alloy of lead and tin, whose manifold uses are well known. More than 22,000 tons is used for babbitt and machinery bearing metals. Without proper bearing metals our modern machinery age would be seriously hampered. Brass and bronze, particularly ornamental bronzes, high-strength and corrosion resistant metals, consume 16,750 tons of tin per year. Tin oxide, an important constituent of bath tub enamels and similar products, opaque glasses, ceramic glazes, along with tin chemicals and other minor uses consume nearly 15,400 tons of tin per year.

Seemingly every year we consume more tin than the total amount imported plus that which is recovered from secondary sources. The difference between this figure and the consumption is apparently accounted for by drafts on stocks.

Unquestionably, however, a part of this unaccounted-for metal may be attributed to the short service rendered by the finished article and the rapidity with which it finds itself in the melting pot. Thus, metal may be re-used several times during the year. The accumulated free stocks of tin are never high.

Babbitt and bearing metals, brasses and bronzes, castings, white metal and type metal are the only uses for tin serving a short period that allow the metal to be re-used, but even these cause considerable losses. The metals used in tin and terne plate, solder, foil, collapsible tubes, chemicals and similar uses are dissipated largely for all time.

Tin plate scrap from container manufacturers is the raw material for the detinning companies producing tin chlorides, which is their major product. These chlorides are used for the "weighting" of silk and in textile printing and dyeing. There is considerable recovery of solder from "sweating" old or junked automobile radiators.

Census reports state that fire extinguishers and sprinkler systems consume 5000 tons of tin per year, and refrigerators some 2500 tons of virgin tin in the form of solder.

Aluminum foil in many industries has successfully replaced tin foil for wrapping various products. This replacement has caused a decreased consumption of 1000 tons of pig tin per year in this field.

World's Output Not Likely to Increase

The Amsterdamsche Bank, in its last quarterly report to the Government Mining Service of the Dutch East Indies, states that, aside from some unforeseen developments, there is no justification for estimating the world's annual tin output at higher figures than

* Consulting engineer, New York.

145,000 to 148,000 tons. As to future prospects the report states:

> If we face the situation in the largest tin producing countries, the Federated Malay States, there are reasons to believe that no important contribution to an increase of the world's production may be expected from this country. In the Dutch East Indies serious efforts have been made to increase the tin production, but the limit will soon be reached there. Siam, Nigeria and Australia still offer a chance for the discovery of new workable alluvial tin fields, which might contribute to an increase in tin exported from those countries. Owing to the present political disturbances in China, it seems difficult to give any reliable opinion as to the future production of that country. Only Bolivia, where tin is obtained from primary fields, must be able to produce far more than it actually does. Finally, although there is but little chance, it is not absolutely excluded that in the near future still some rich tin fields, either primary or alluvial, may be discovered in other countries. There are hopes set on "Dark Africa," which continent surprised us in the beginning of this century with its tin fields in Nigeria and Transvaal.
>
> However, apart from such surprises, we are not justified in estimating the world's output of tin higher than 145,000 to 148,000 tons. Any important influence on tin prices can be caused only by a change in the consumption.

In an article in the April issue of "Foreign Affairs," H. T. Warshow, controller of the National Lead Co., writes:

> It is perhaps natural for consumers of tin to see in the rising market the manipulations of some combination, rather than to realize that the higher prices are merely the result of the normal operation of the law of supply and demand. It is a fact that the production of tin has been rising in the last few years and that the year 1925 witnessed the largest output that the world has seen. But the number of independent companies and individuals mining tin is so large that a combination or any sort of understanding to limit production would be difficult. While it is true that the smelting of Straits tin is entirely in the hands of two large companies, the Eastern Smelting Co. and the Straits Trading Co., their stated policy is not to hold any tin for their own account but to sell it all immediately for smelting, thus protecting themselves from the vicissitudes of the market. The fact is that, although the tin supply has been increasing, it has nevertheless failed to keep up with the rising demand, especially in the United States.

Lower Consumption Only Cure for High Prices

The general situation is a difficult one and many qualified experts have asserted that any future decrease in price must come about through a decrease in consumption rather than an increase in production. The more pessimistic believe that the sources for further supplies are limited and that the present rate of consumption is rapidly bringing about the exhaustion of the world's tin resources.

G. T. Bridgman, mining engineer for Guggenheim Brothers, New York, who own large Bolivian mines, foresees a production of tin at about the present rate for the next ten years, with acute price fluctuations synchronizing with general prosperity; and a "constant, fairly rapid and virtually complete approach to exhaustion" of the world's tin resources thereafter, with no limit to the levels to which prices may rise.

Better Smelting Methods May Change Situation

Even if these predictions were acceptable, it must be pointed out that they are based upon present knowledge of the technique of mining and smelting. South America and other countries of the world, not yet fully explored, possess millions of tons of low-grade tin ore which thus far have no commercial value. Sooner or later developments in our technical knowledge will make them workable and their treatment commercially necessary and profitable. Cornwall, England, whose mines were thought almost entirely worked out, is now going through a revival stage as a result of high tin prices and the discovery of new valuable lodes at lower levels through the sinking of deeper shafts. The "free setter" or individual mine owner-operator has again appeared in Cornwall.

In Yunnan, China, the forests surrounding the tin smelters have disappeared as a result of charcoal manufacture. Charcoal is used there as a smelting fuel. They must now change their antiquated methods for more modern ones. The mine owners are only now installing ventilating machinery to allow mining at greater depths than formerly. Ore dressing methods can be greatly improved throughout all of China.

The technical branch of tin mining in Bolivia is still backward. Many mines cannot make better than 70 per cent recoveries of the tin value of their ores, due to inadequate machinery. The Bolivian Government is beginning to interest itself in bettering tin mining practice, as export duties on tin concentrates bring about three and a third million dollars to the government. Other than the Patíno and Guggenheim mines in Bolivia, all mines there need modernization, new equipment and better ore dressing machinery to increase metal recoveries. The Patíno Mines & Enterprises Consolidated shows net quarterly profits in the neighborhood of three-quarters of a million dollars.

Regulating the Price of Tin

Every once in a while we hear reports of intentions or desires to regulate the price of tin. It is true that three of the largest operators are in the British Empire: The Straits (Malay) Trading Co. producing about 50,000 tons of tin metal annually; Williams, Harvey & Co. (Bootle, England) producing about 30,000 tons per year; and the eastern and Cornish smelting companies contributing something like 25,000 tons annually.

There have been rumors lately of steps being taken to bring these three groups together to influence tin prices by artificially creating shortages. This attitude would bespeak an entire change of policy for these companies, as they have always been averse to speculation. Even, a few years ago, when tin sold at a price which paid very few British-owned mines to operate, efforts to induce mines to close down to influence prices were unavailing.

Substitutes for Tin Possible

If attempts are made to create artificially a tin shortage, there would be a great impetus toward the development and use of substitutes. Experience shows that consumers will adopt most any kind of expedient to retain their independence. We have today the "tinless" can for food products, which year by year will be of greater commercial importance—a tin shortage would bring them into prominence with great speed.

Antimony oxide can be and is used to replace part or all of the tin oxide used for enamels. Aluminum in the shape of foil has made serious inroads on its tin competitor; perhaps when manufacturing costs are reduced, aluminum collapsible tubes will follow the same trend. During the war, cadmium was advocated as a white metal alloy constituent to replace tin—it has possibilities of development which should carry along with it cheaper prices for cadmium as the result of greater production.

How Cost of Tin Is Distributed

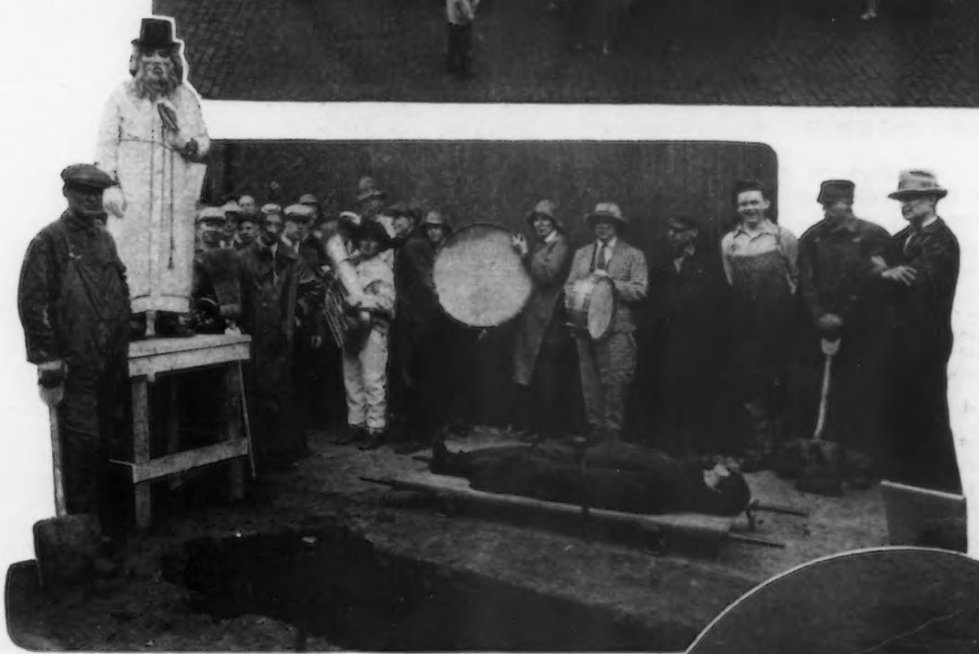
In Bolivia, it costs $450 to $500 to mine, sort, dress and concentrate material containing the equivalent of a ton of tin. Smelting, usually at a British plant, adds $50 to $60 per ton. Export taxes of the various governments, freight, reshipment losses, and smelter's, miner's and broker's profits, make up the remainder of the present price of $1,200 to $1,300 per ton of tin. Small mines all over the world cannot afford to operate when tin drops below $850 per ton in the shape of concentrates. This artificially keeps up prices, for when the tin price falls below this figure, a large number of small mines close, thus cutting down available supplies until the price again rises, when they reopen.

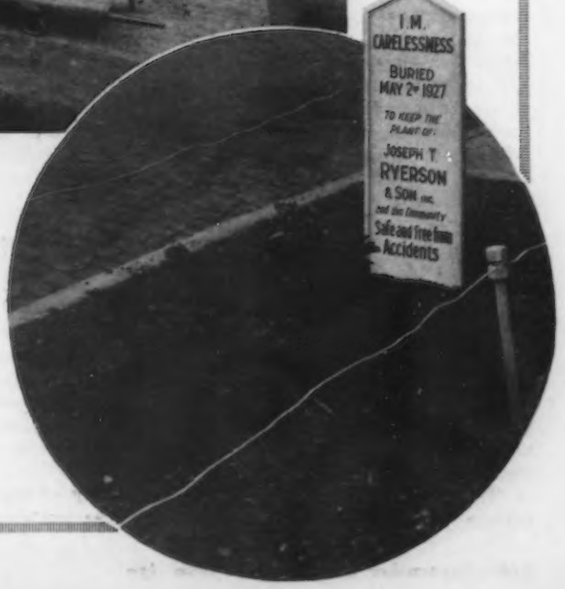
The United States, the largest consumer of tin, does not seemingly face a "hold up" by foreign producers of this important commodity. At the present time, it appears that consumption may shortly equal or exceed production, but new technical methods, plant modernization, utilization of lower grade ores, better mining methods, will make available greater supplies of this "semi-precious" metal.

The American Radiator Co. announces the removal of its plant purchasing department from 1807 Elmwood Avenue, Buffalo, to its general offices at 40 West Fortieth Street, New York.

Avoid Accidents By "Burying" Carelessness

Ryerson Plant Operates 57 Days Without Mishap as Result of Unique Safety Measure



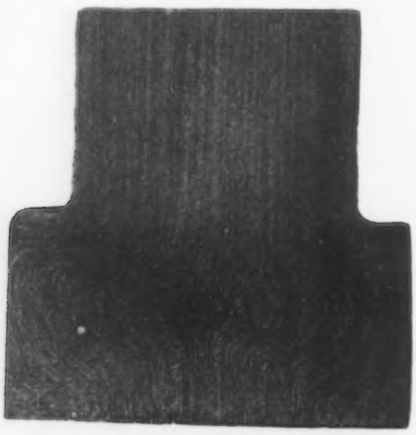


THE Upper Photograph Shows the Funeral Cortege of "Old Man Carelessness," Made Up of the 400 Employees at the Chicago Plant of Joseph T. Ryerson & Son, Inc. In the center of the page can be seen the crowd listening to the funeral oration, and at the right, the grave of the mythical individual, which is located in front of the plant. These ceremonies ushered in the company's safety campaign by which it was able to make an unusual record.

HIGH-STRENGTH CAP SCREWS

Produced from Processed Bars by Cold Heading and Heat Treatment

FOR many years the type of cap screws or special bolts favored for high stress were made from hexagon steel bars on automatic screw machines. Because of the wastefulness of this process, attempts have been made to substitute cold headed products, in order to take advantage of the evident savings, especially noticeable in longer screws. These attempts were not always successful because the low-carbon steel used has a low yield point, and would "stretch" or acquire



Polished and Etched Section Through Cap Screw, Showing Flow-Lines Produced by Cold-Heading

a permanent set far sooner than the cold drawn S.A.E. 1112 steel in the milled-from-bar product.

It became apparent that to retain the favor of motor car builders, it would be necessary to produce a sound cold headed standard cap screw from sufficiently high yield point material to bring the product up to or above the strength and quality level of the standard milled article.

To this end an investigation was planned by the Victor-Peninsular Co., Detroit, which in brief had the following objectives:

1. To secure a cold heading steel of sufficiently high carbon, which after heat treating would produce the desired physical properties
2. Elimination of unsoundness
3. The development of methods and tools for cold heading and finishing this higher carbon steel within reasonable cost limits

A Cold Heading Wire Developed

The first object was attained by a cooperating steel company in the development of a cold heading wire now known as V. P. processed 30-37 steel. This wire contains 0.30 to 0.37 per cent carbon and 0.65 to 0.85 per cent manganese, a little higher than S.A.E. 1035. In the preparation of this material hot rolled rods are given a high anneal and a light cold finishing draft. The large crystalline grain and relatively low internal strain from cold working developed in this processing are calculated to make an ideal cold heading steel. After quenching from 1550 deg. Fahr. and drawing to 196 to 241 Brinell hardness, the following physical properties are exhibited:

Brinell Hardness	Yield Point, Lb. per Sq. In.	Ultimate Strength, Lb. per Sq. In.	Elongation, Per Cent	Reduction of Area, Per Cent
196	75,000	92,000	22.0	66.0
241	94,000	115,000	18.0	57.0

To insure uniform physical properties after treatment, it has been found necessary to give the incoming wire 100 per cent inspection by the spark test, supplemented by chemical analysis of samples taken from 10 per cent of the bars. This procedure is now applied to all raw material coming into the Victor-Peninsular plant.

The development of tools for the heading of higher carbon wire was a long process, but was materially simplified when proper cold heading steel was secured.

After securing the proper analysis and structure in the steel, supplemented by 100 per cent inspection of the incoming material, no longer was any unsoundness found in the upset product, nor the familiar splits on the periphery of upset blanks arising from seams fully or partly oxidized. The accompanying cut illustrates the flow lines obtained in proper metal after upsetting by technically developed tools.

Special Heating and Quenching Equipment

Equipment available for heat treating work of this character did not produce the uniform results desired. This was due to two factors—lack of precise heat control and proper quenching facilities. Several commercial designs of quenching tanks were investigated, but all of them turned out work somewhat non-uniform in hardness, especially in the smaller sizes of cap screws, due to the parts stacking and nesting together. It was therefore decided to design and build within the plant some heating and quenching equipment especially for the product. This has been done and today the Victor-Peninsular plant is equipped with three hardening and four tempering units which treat the material without collision between units and consequent damage to threads.

The hardening furnace consists of a long, narrow heating chamber; the material is conveyed through it by means of an endless belt made of special alloy steel. The heated work drops, a few pieces at a time, directly into the quenching tanks and is conveyed out by means of a woven wire belt which offers little resistance to the circulation of the cooling medium.

The tempering furnaces are of the same design, the heated parts being quenched directly from the belts into a solution of soluble oil. This reduces the time required and holds oxidation at a minimum.

Merger of Handling Equipment Makers Involves Extensive Facilities

The Brown Hoisting Machinery Co., Cleveland, the directors of which have approved consolidation with the Industrial Works, Bay City, Mich., as mentioned in THE IRON AGE last week, was founded in 1880 by Alexander E. Brown. Its principal plant occupies 9½ acres on St. Clair Avenue in Cleveland, and it also owns a completely equipped iron and bronze foundry at Elyria, Ohio. The company designs and manufactures hoisting and conveying appliances and heavy handling machinery of all descriptions, including locomotive cranes, grab buckets, combination shovels and cranes, ore unloaders, bridge cranes, gantry and portable cranes, trolleys and hand traveling cranes.

The Industrial Works, which was founded in 1873 by George C. Kimball, James Clements, E. Wells, and Charles R. Wells, occupies 29 acres at Bay City, its plant consisting of 60 buildings and 440,000 sq. ft. of floor space with complete steel, iron and brass foundries, pattern, machine, structural, boiler and blacksmith shops and complementary departments. Its principal products are locomotive cranes; wrecking cranes; heavy duty and full revolving pile drivers; crawler cranes; shovels for gasoline, steam, electric or Diesel operation; gantries; pillar cranes, rail saws; buckets; steam hammers, and coke oven machinery, including coke pushers, coal chargers and clay carriers.

Last year the combined sales of both companies totaled more than $7,700,000. All plants will be continued in operation and no extensive changes are contemplated. The object of the consolidation is stated as "the rendering of better service to users of material handling equipment by means of eliminating duplication or overlapping of product, by effecting economies in manufacture and by concentrating in each plant that portion of the work which can be there produced at the best advantage."

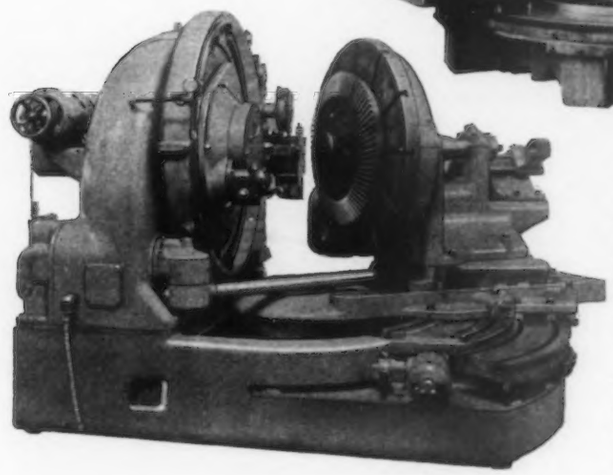
A ceramic tour abroad has been planned by the American Ceramic Society, 2525 North High Street, Columbus, Ohio. The dates are May 19 to July 5, 1928, inclusive, and the tour has been built around European ceramic centers, including those in England, Netherlands, Germany, Czechoslovakia and France.

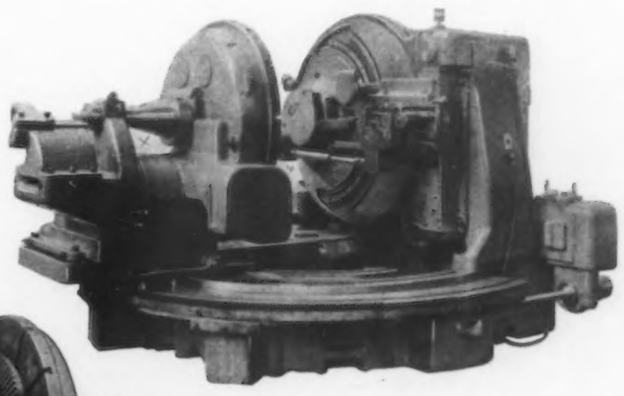
Cuts Large Spiral Bevel Gears

New Gleason Planing Generator Has Capacity for Gears Up to 60 In. in Diameter — Unusual Accuracy a Feature

LARGE spiral bevel gears are generated with a single planing tool on the 60-in. planing generator here illustrated, which has been developed by the Gleason Works, Rochester, N. Y. The machine has capacity for gears up to 60 in. in diameter, with a 10 to 1 ratio, and up to 42 in. in diameter with a 1 to 1 ratio. The spiral angle of the teeth can be varied from 0 to 30 deg. Index change gears are provided for numbers of teeth from 12 to 180, not including prime numbers above 100. The machine is practically universal within its range, except for certain slight limitations between spiral angle and cone distance due to required clearances.

The Spiral Angle of the Teeth Can Be Varied from 0 to 30 Deg. Index change gears are provided for numbers of teeth from 12 to 180, not including prime numbers above 100





The Tool Slide Is Reciprocated by a Simple Crank Drive. During one revolution of the blank, the tool makes as many strokes as the number of teeth

For cutting bevel gears above about 40 in. in diameter, machines previously available were of the planing-forming type in which the tooth profile curve is obtained by a direct copying process. In the new Gleason machine the same accurate generating principle is used as in the company's smaller straight bevel gear and the spiral bevel gear generators. In this generating method of cutting bevel gears, the tool is carried on a cradle which rotates very slowly, and in effect the tool represents a tooth of a crown gear. Relative motion between the blank and the tool occurs, similar to the rolling together of the gear with a crown gear. By this process a tool with a straight cutting edge automatically produces the correct profile curves on the teeth.

The tool slide is reciprocated by a simple crank drive of adjustable stroke almost directly connected to the motor, while the gear blank rotates continuously and at a uniform rate. During one revolution of the blank, the tool makes as many strokes as the number of teeth. These motions continue without interruption until the operation is finished and the machine is stopped automatically. It is pointed out that because of the continuous rotation of the blank and the tooth-to-tooth action of the tool, there is no first or last tooth—all are being worked on continually. It is claimed that uniform tooth shape and closely accurate tooth spacing are thereby obtained.

In addition to the motions of the tool and blank described above, the cradle on which the tool slide is carried is given a slight rocking motion to obtain the desired lengthwise curvature across the face of the gear. The spiral angle is controlled by offsetting the tool slide from the center of the cradle. For this purpose the tool slide is placed on a movable arm which can be swung to the required angular position about the center of the crank. If this arm is set so that the path in which the tool reciprocates passes through the center of the cradle, only a small spiral angle is produced due to the slow rotation of the blank. The angle can be increased as desired by swinging the tool arm away from the central position.

Gear blanks are first roughed out with slotting and V-tools; the teeth are then finished with straight-edged tools working on one side at a time. The same pair of finishing tools can be used for a considerable range of pitch, and because of their simple form, the cost of tools is comparatively low. The tool is lifted entirely out of the cut during the return stroke, this being accomplished by a positively-operated clapper block.

The head on which the blank is mounted is double-ended, one end being used in cutting gears and the other in cutting pinions. This design permits the use of a large index worm wheel mounted close to the gear faceplate for accurately controlling the blank rotation.

The head is built on a pivoted base to facilitate the swinging of either end into position. A direct-connected 10-hp. constant-speed motor is employed to drive the machine. Change gears are furnished for various speeds. Lubrication of the machine is automatic except for a few hand oilers. There is one oil pump for the lubrication system, and another for the cutting oil. The lubricating oil returned from bearings is circulated through a filter before going back to the well and the cutting oil is strained before returning to the reservoir.

It is stated by the company that this new type of bevel gear planing generator is considerably faster than the old-style forming planers, while the accuracy and quality of finish produced by the new machines are beyond comparison. Bevel gears generated on a 90-in. machine of this type which has been in operation at the Gleason plant for more than 2 years are said to be

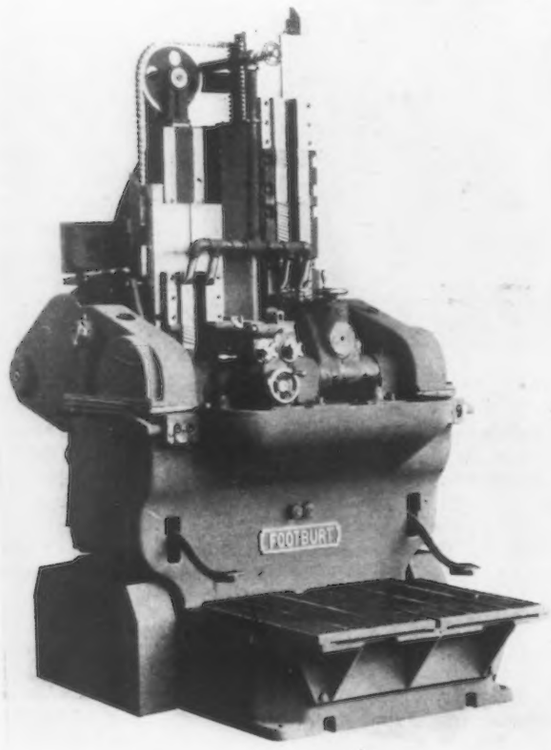
in satisfactory operation at pitch line velocities from 4000 to 5000 ft. per min. The development of these machines means that large bevel gears can be cut by the generating process with a degree of accuracy, giving quiet running qualities, not previously available, states the company's announcement.

Flat Surfaces Finished by Broaching

Automobile Steering Knuckles Broached At Rate of 120 Per Hour —Close Accuracy, As Well As High Production, Claimed

FLAT or irregular surfaces are finished by broaching in place of milling on a new machine recently added to the line of the Foote-Burt Co., Cleveland.

With this machine, designated as the "Footburt" broaching machine, one or more surfaces are roughed and finished in one operation. Excellent finish and the holding of the cut within unusually close limits are claimed. An example of work broached by the machine is the machining of both sides of the two bosses, four surfaces in all, on an automobile front steering spindle connecting rod yoke. These pieces are said to be handled by one operator and one machine at the rate of 600 per hour.



The Broaching On Automobile Steering Knuckles Is at Rate of 120 Pieces Per Hr. The piece is clamped by hand and the trip operated by foot pedal

Another example is the work on automobile steering knuckles, the two flat surfaces that receive the dust cover for the front wheel brake being broached at the rate of 120 pieces per hour. It is pointed out by the company that this production could be materially increased were it possible for one operator to load and unload work at a faster rate. On the steering knuckle the travel of the broach is 9 ft. per min., which is only about 10 per cent of its possble cutting speed. The unusual accuracy and finish obtained is attributed to the fact that the lower teeth on the broach do the roughing work and the upper teeth make the lighter finishing cuts. Also, the teeth of the broaching tool are solidly supported directly behind the cutting edge.

The arrangement of the main members of the machine, the base and two uprights, may be noted from the illustration. Slides to which cases holding the broaches are bolted, operate alternately up and down on the ways of the uprights. The machine is driven by a 17-hp. elevator-type reversing motor through a set of spur gears and one set of bevel gears to the driving pinion. This pinion is between the two slides and in mesh with hardened steel racks mounted on the slides. The slides counterbalance each other, and as one moves up, the other moves down. They operate continually at a predetermined speed. Dogs bolted to the left-hand slide, operate a lever which actuate the switch governing the reversing of the motor.

Work Holding Fixture of Tip-Up Type

A tip-up fixture is employed for holding the work to be broached. When the slide is at the bottom of the stroke the fixture is in a horizontal position. The piece to be machined is placed in the fixture while the slide moves up, and as soon as the piece is in place, a lever is tripped. Provided the lever is operated before the slide reaches the top of the stroke, the fixture is automatically tipped to an upright position. The slide moves down and the piece is broached, the fixture being automatically thrown back into the horizontal position for unloading and reloading as soon as the slide has completed its downward stroke. One operator is able to unload and reload each fixture as it is thrown back into the loading position.

Broaches and fixtures used on the machines vary according to the nature of the work. With the steering spindle connecting rod yoke, speed in loading and unloading is essential and the yokes are merely placed in position in the fixture without clamping. For convenience, a hand trip lever is used and when the fixture is tipped the piece is automatically clamped in place. When the fixture is thrown back to the horizontal position the piece is released and may be picked out. The trip lever acts as a safeguard as it cannot be operated if the piece is not in the proper position. If the trip lever is not operated before the slide reaches the top of the stroke, the fixture will not be tipped up until the next cycle.

The entire base of the machine is used as a coolant tank and has a capacity of 60 gal. Coolant is delivered to the work at the rate of 40 gal. per min. This machine will have its first showing at the National Machine Tool Builders' Association Exposition, to be held at Cleveland, Sept. 19-23.

Giddings & Lewis Grinding Machine Interests Acquired by Heald Company

The grinding machine interests of the Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., have been acquired by the Heald Machine Co., Worcester, Mass. The purchase includes drawings, patterns, tools, jigs and fixtures, inventory of machines and parts, patent rights and good-will.

Outstanding in the G. & L. grinding machine line is the Teromatic internal grinder, which has been on the market for more than four years. A feature of this machine is the automatic sizing, the positive gaging principle employed having been invented and patented by J. G. McDonough, Eau Claire, Wis. The distribution of the Teromatic will for the time being be continued through the machine tool dealer organization which has previously handled this machinery, but in the near future the distribution will be taken care of by the branch offices of the Heald company in various cities, and by the company's agents in this country and abroad.

The Teromatic and other internal grinding machines, together with the Heald rotary surface grinders and cylinder grinders, will be manufactured at Worcester, Mass.

LARGE CYLINDRICAL GRINDER

Field For Straight-in Cut Grinding Broadened By New 14-In. Heavy-Duty Machine

THE Norton Co., Worcester, Mass., is introducing the 14-in. heavy-duty type BA cylindrical grinding machine here illustrated, which, it is pointed out, extends the field for straight-in grinding to a wide variety of work previously considered beyond the capacity of this grinding method. The machine has a swing of 14 in. and provision is made for a wheel width of 15 in.

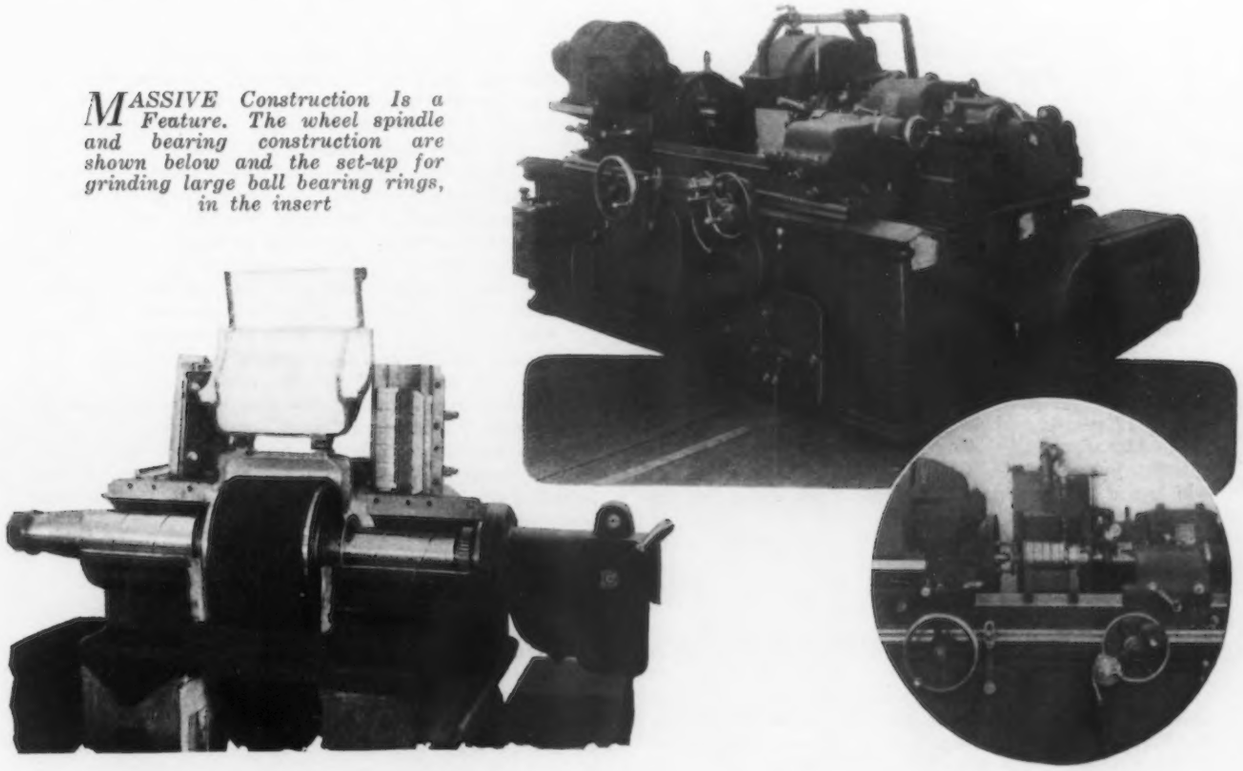
In principle the machine is of the company's type BA construction comprising all the features of the 10-in. type B grinding wheel unit. All dimensions, however, have been increased to provide bearing areas and ruggedness ample for the requirements of the heavier wheel and work. It is built in lengths to accommodate all work of the class for which the machine is adapted.

The arrangement is for self-contained motor drive, with a 30-hp. constant-speed motor for the main drive and a 2-hp. adjustable-speed motor for the headstock. The main drive is from the motor mounted on the rear of the machine through an endless belt 9 in. wide to the power shaft in the wheel unit base of the machine. This power shaft in turn drives the wheel spindle through an endless belt 9 in. wide and operates the pump, power wheel feed and power table traverse for truing the wheel.

The power wheel feed is arranged for 20 different infeed speeds. The infeed motion is steady and positive and at the predetermined size the feed is stopped automatically by contact of the index with the index pawl. Compensation for wheel wear may be made conveniently by movement of the index in increments of 0.00025 in. on the work diameter.

Heavy design characterizes the wheel spindle, which is 47 in. long, overall, and runs in Norton type B spindle bearings. These boxes comprise a solid half bearing with two adjustable bearings backed by thumbscrews, permitting adjustment while the spindle is running. Lubrication of the spindle bearings is by force feed system. A pump geared to the spindle and located below the smaller bearing draws oil from the reservoir in the wheel slide and delivers it through valves to the bearings. The spindle drive is from the power shaft below, the belt pull being downward. A weighted idler on the drive belt serves to maintain belt tension, with the slide in any position.

A wheel spindle reciprocating attachment can be applied for slowly moving the wheel back and forth in the direction of its axis. This action is said to improve the finish and to permit economies through the production of more pieces for each wheel truing, with the resultant savings in diamond, wheel loss and truing time. The amount of reciprocation can be changed to meet the requirements of the operation. The maximum motion is ⅝ in. and the minimum ⅛ in., the adjustment being made by removing the cover on the back of the attachment and setting the dial for the length of stroke desired. It may be stopped entirely for wheel truing or shoulder grinding merely by moving a lever on the front of the attachment.



MASSIVE Construction Is a Feature. The wheel spindle and bearing construction are shown below and the set-up for grinding large ball bearing rings, in the insert

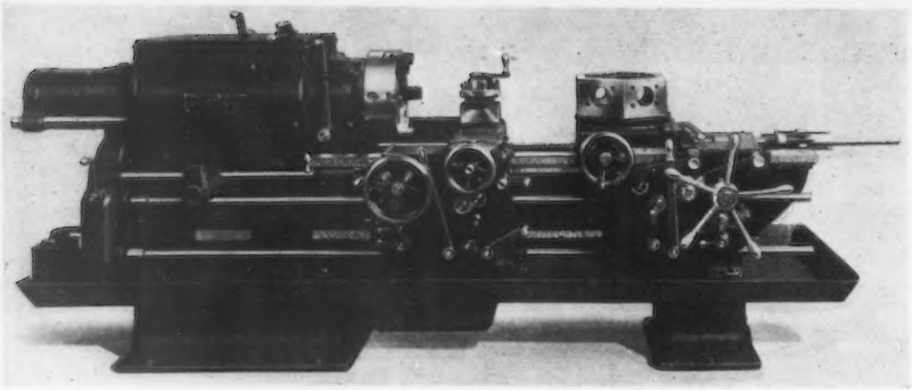
Power table traverse is provided for use in truing the wheel, a lever on the front of the machine controlling the starting, stopping and reversal of the traverse action. Variable work speeds are available through the use of an adjustable-speed headstock motor operated through a drum controller.

The weight of the machine, in the 24 in. length and without motors, is approximately 11,800 lb.; with motors, the weight is approximately 13,300 lb. The machine will be demonstrated by the company at the National Machine Tool Builders' Association Exposition, to be held at Cleveland, Sept. 19-23.

Inspect New Cranes at Alliance Plant

About thirty leading electrical superintendents and chief engineers of various steel plants were guests Aug. 23 of the Alliance Machine Co., Alliance, Ohio, having been invited to visit that company's plant to inspect several of its new worm-driven cranes recently completed.

One of these is the first of six 175-ton, with 40 and 15-ton auxiliary hoists, worm-driven roller-bearing ladle cranes that are being built for subsidiaries of the U. S. Steel Corporation. Another is a 15-ton double hook mill crane trolley built for the Ford Motor Co., Detroit. Every motion of this trolley is worm driven. A third is a 75-ton 180-ft. span, special sheet handling crane that is being built for the Gary, Ind., plant of the American Sheet & Tin Plate Co. This has a 5-ton worm driven auxiliary hoist.



The Machine Is of Universal Type. There is a square turret on the side carriage and a cross-feeding hexagon turret on the rear carriage. A fixed center turret is optional

Turret Lathe for Variety of Medium Size Work

A wide variety bar work up to 3½ in., or chucking work up to 16 in. in diameter can be machined in the turret lathe illustrated, which is a recent addition to the line of the Gisholt Machine Co., Madison, Wis.

This machine, designated as the No. 2L, incorporates the full universal two-carriage principle of the company's previous turret lathes, and as an optional feature it has a cross feeding turret, as on the company's Nos. 3L and 4L machines described at length in THE IRON AGE of April 29, 1926. The bed is massive and the headstock walls are extended up above the spindle and back shaft bearings, so that no gearing is carried in the covers and all shafts are held in permanent alignment. The power is transmitted from the single driving pulley through a multiple-disk friction clutch, of bronze and saw steel plates running in oil, and through a train of hardened alloy steel gears, giving 12 speeds and reverse. Speed changes are accomplished by means of sliding gears on splined shafts. The spindle is mounted in cylindrical babbitt bearings, which are carried in tapered cast iron shells for adjustment, and spindle thrust is taken on a large ball bearing against the housing. All other power transmitting shafts in the machine, including those in the apron, are mounted on large ball bearings.

Sixteen feeds are provided, eight independent feed changes being located in each apron and another feed change at the end of the machine. A lead screw thread cutting device is furnished whenever the work requires thread chasing, and a taper attachment is located in the side carriage or may be attached to the cross feeding turret carriage. For the assistance of the operator, a rapid traverse is provided for the longitudinal movement of the side carriage and of the turret carriage, also a rapid traverse for the in-and-out movement of the square turret on the cross slide.

The flat ways of the machine are covered with hardened steel plates and lubrication is by a force feed through the bottom of the two slides. The headstock and spindle bearings are lubricated by splash and the traverse and feed works by pressure.

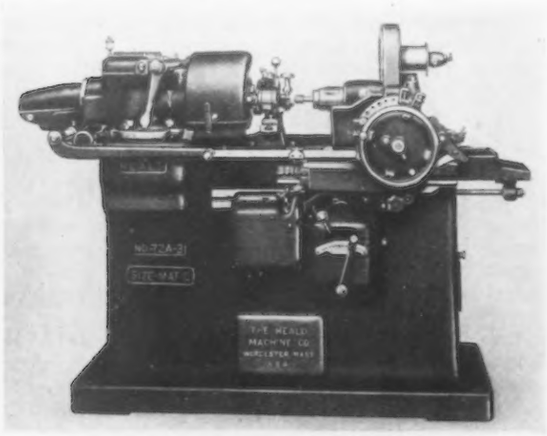
The machine is driven by a 10-hp., 1200-r.p.m. motor, connected by means of V-belt, flat leather belt or silent chain. The floor space occupied is 45 x 128 in., and the length with bar feed is 203 in. The weight of the bare machine is 7200 lb.

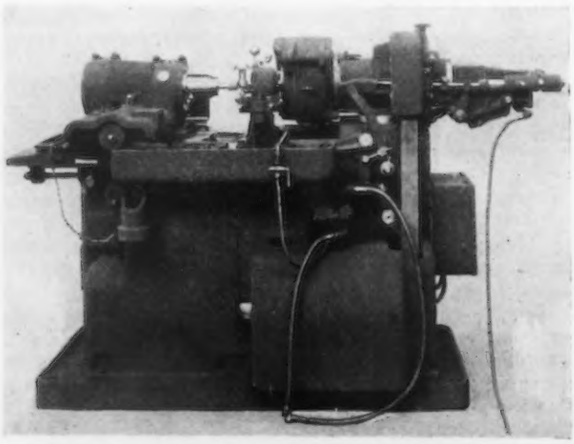
Improves Internal Grinders and Adds Unit for Short Work

The Heald Machine Co., Worcester, Mass., has redesigned its line of style No. 72 internal grinding machines, including the plain, semi-automatic and Size-Matic types, and has added a new model designated as the style No. 72A-2, for short work.

The new model is intended to meet the demand for a machine with a short base, handling work not over 2 in. long, such as ball races, gears, rings, etc. The ways are but 55 in. long, which adapts the machine for conditions of limited floor space. The machine has all the features of the company's Style No. 72 Size-Matic and can be furnished in either belt or full motor drive. Many improvements embodied in tne new small model have been incorporated also in all of the company's style No. 72 machines, which are now designated as the style No. 72A. The principal working units, such as the hydraulic drive for the table, the ball bearing workhead, automatic micrometer diamond, cross slide, etc., remain as heretofore, with only slight improvements.

The base is designed with both ends cast straight down from the ends of the ways to a foot, which has been made wider and is cup shaped. This acts as a reservoir to catch coolant that may escape the guards. The height of thc base has been shortened, the distance from the floor to the center of the work spindle being 44 in. instead of 47⅛ in. As many internal grinders are used continuously on work with holes of approx-





The New Model Is for Short Work, Not Over 2-In. Long, Such as Ball Races, Gears, Etc. The rear view at the right shows the arrangement for motor drive

imately the same diameter, it is necessary to have but one speed for the workhead, and thus it has been possible to simplify the workhead drive on both the belt- and motor-driven machines. A single-speed countershaft is furnished from which a belt drives directly down to a proper size pulley on to the backshaft and then from a pulley up to the workhead. The wheel head is driven as formerly from a long drum on the countershaft. Where there is a variety of sizes of work and it is desirable to have a number of changes of speeds for the workhead, the five-speed countershaft and jackshaft previously furnished will be supplied.

For the two-motor drive machines, the backshaft motor is arranged with a double-end armature shaft. On one end is a suitable size pulley for driving the workhead at the desired speed. The other end is directly connected to the oil pump through a coupling which in itself is a pulley for driving the water pump, and also a sprocket that drives the generator through a silent chain. Thus the regular backshaft has been eliminated and the arrangement on the back of the machine has been very much simplified. The wheelhead motor is the same as on the No. 72 machines. On three-motor drive machines the motor at the rear has a single end shaft and drives, in a manner similar to the two-motor drive, the water pump, oil pump and generator. The workhead is arranged as previously, an individual, adjustable speed, direct-current motor being mounted on the top of the workhead. The wheel head has not been changed.

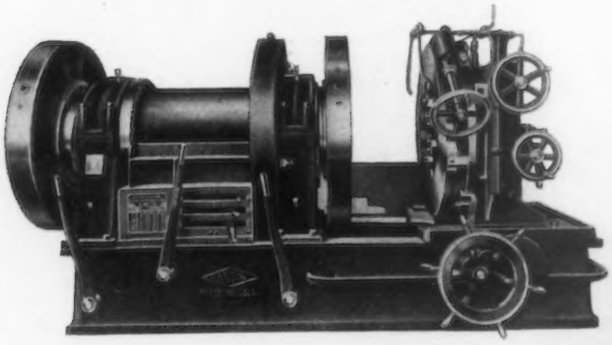
The slow down valve and diamond control has been simplified and changed in position. It is now located at the right-hand end of the rear of the base, away from water and dirt and in a convenient place for adjustment. In general, this unit operates the same as previously. A guard now covers the entire back of the machine, keeping out dirt and foreign matter as well as safeguarding the workmen.

Various lengths of bases can be furnished and these determine the models now available. The new machine, the model No. 72A-2, swings 15½ in. over the table and 12 in. inside of the water guard. The diameter of the hole that can be ground is 5 in. The machine may be arranged from any one of eight standard workhead speeds, 230 r.p.m. being the minimum and 640 r.p.m. the maximum. Other speeds can be furnished. Table speeds are from 0 to 50 ft. per min. The total floor space required is 50 x 108 in. The weight of the small machine is 4500 lb. net.

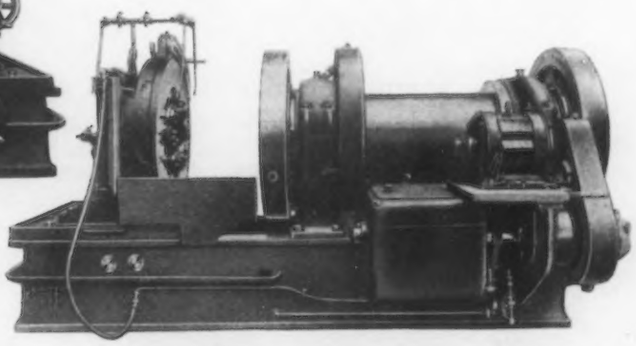
The model No. 72A-3, which replaces the style No. 72, has ways 61 in. long and can be furnished as a plain machine, semi-automatic or Size-Matic, belt or full motor drive. The No. 72A-5 unit replaces the style No. 72 with 12 in. extended base. It has ways 73 in. long and is furnished where length is required. It is available as a plain, semi-automatic or Size-Matic unit.

New 16-In. Pipe Threading and Cutting Machine

The Landis Machine Co., Waynesboro, Pa., has added to its line a new pipe threading and cutting-off machine having a range from 8 to 16 in., inclusive. One die head is employed and the entire range is covered by but one set of chasers. The travel of the carriage of this machine is 25 in. and eight speeds are provided. The floor space required is 6 ft. 2 in. x 11 ft. 6 in. The weight of the belt-driven unit is 16,900 lb. and motor-driven machine, 18,000 lb.



The Range of the Pipe Threading and Cutting-Off Machine Is from 8 to 16 In., Inclusive



In the Motor-Driven Unit a 20-Hp. Constant-Speed Motor Is Mounted on a Plate Over the Gear Box

The machine is provided with a gear box and single-pulley drive, the gear box, through which eight speeds are obtainable, being located beneath the main spindle. All gears are of steel, have cut teeth, and run in an oil bath. Shaft bearings are lubricated by a forced feed system and the main bearings by flat link chains running in oil reservoirs. The front and rear gripping chucks are of three-jaw type and have universal adjustment. The rear chuck is equipped with flange grips for screwing flanges and collars on and off. A reverse drive, located in the gear box, is used for putting on and taking off flanges, this reverse being controlled by the middle lever shown on the front view illustration. The lever near the front chuck is employed for starting and stopping the machine when threading and the lever located near the rear chuck is used for starting and stopping the machine when doing flange work.

In addition to supporting the die head, the cross rail of the machine is fitted at the rear with centering jaws, cutting-off tool, and reaming tool. The reaming tool may be locked for the reaming operation, which arrangement is stressed as permitting smooth reaming operation. The same tool may be employed also for chamfering the ends of the pipe. The die lubricating system includes a rotary pump, a by-pass for the surplus oil, and special control valves at the head and cutting-off tool.

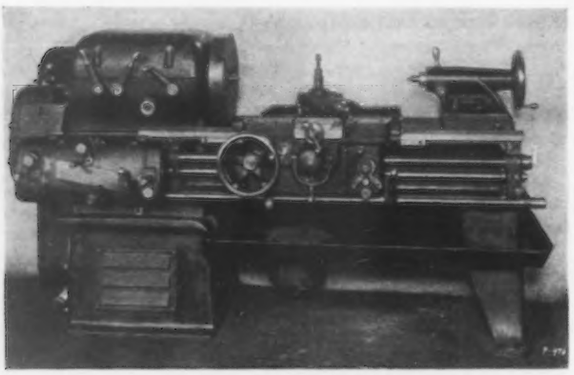
The accompanying rear view illustration shows the same machine arranged for motor drive. The motor is mounted on a plate over the gear box and the power is transmitted by means of silent chain. A 20-hp. 1200-r.p.m. constant-speed motor is employed. The company's stationary pipe die head and the Landis "long life" tangential chaser are used on the machine.

Construction is well advanced on the new nut plant at Coraopolis, Pa., of the Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y. This plant will be devoted exclusively to the manufacture of cold-pressed nuts.

Offers New Model 14-In. Geared-Head Engine Lathe

A new model geared-head 14-in. engine lathe, which in some respects constitutes a radical departure from previous models included in the company's line, is being placed on the market by the Reed-Prentice Co., Worcester, Mass. The machine is intended for heavy-duty production work, and although rated as a 14-in. machine the actual swing over the bed is 16½ in.

The sliding gear head feature is new in the Reed-Prentice design. With nine gears, eight spindle speeds,



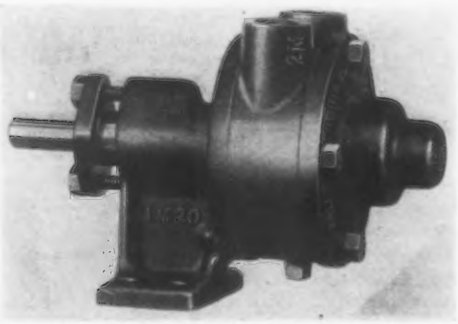
The Lathe Is Intended for Heavy-Duty Production Work. The sliding gear head is a feature

ranging from 16 to 384 r.p.m., are obtained, changes being accomplished by means of three levers on the front of the headstock. The quick-change bank has the unusual range of feeds from 0.0025 to 0.160, and of threads from 2 to 128. There is provision for compounding for additional threads. The drive is by belt from a 3 or 5-hp. motor mounted in the cabinet leg. An adjustable idler provides correct belt tension. Two levers, one at the headstock and one at the apron, operate the friction start and stop. Cross and longitudinal feeds are operated by a single yoke-handled lever at the apron. The tail-stock binder is of improved type. The lathe carriage is arranged to receive a taper attachment should one be desired.

This lathe will be in operation at the National Machine Tool Builders' Association Exposition, to be held at Cleveland, Sept. 19-23.

Reversing Pump For Machine Tools

Simplicity of construction and fewer working parts than usual are stressed in connection with the reversing pump here illustrated, which is intended for use on



The Pump Discharges the Coolant Continuously Out of the Same Port Regardless of the Direction of Rotation

milling machines, turret lathes and other machine tools requiring a steady flow of coolant at the cutting tool.

In this machine, which is obtainable from the Tuthill Pump Co., 131 West Sixty-third Street, Chicago, the pumping mechanism consists of two gears, one an internal and one an idler. The space between these gears is filled by a crescent member, which seals the liquid from one side or the other. In the reversing style, the crescent and idler gear are journaled in the front cover in such a way that they are allowed to rotate through 180 deg., as the direction of rotation is reversed. It is stated that the flow is always out of one port, regardless of the direction in which the pump is rotating. Six different sizes of the pump ranging from ½ to 52 gal. per min. are available.

New Light Tiering Tructor

A new light-duty electric tiering tructor has been added to the mill type series of the Elwell-Parker Electric Co., Cleveland. This machine is designed to handle skid loads, as in regular power-lift truck service. In addition, it elevates the load from the floor for 4 to 8 ft. when tiering or stacking in storage, stock room, delivering goods to motor truck or to railroad car from rail level to car floor.

This 2-ton tiering truck completes the line of this type, the two previous sizes being rated 3 and 6 tons. The three machines cover the range for most high-lift operations required in industrial materials handling.

Of all steel construction, the new machine is built with interchangeable parts. The power plant is of the unit type—inclosed motor, steel brake drum, steel multi-thread Brown & Sharpe worm to bronze differential cage and cross, chrome vanadium drive shafts and universal joints. This permits steering and the delivery of power to the steel clutch plates bolted to outside of

2-Ton Tiering Tructor at Work

drive wheels, which are fitted with solid rubber tires and Timken tapered bearings. The third point of support of the power plant is a ball beneath the drive motor.

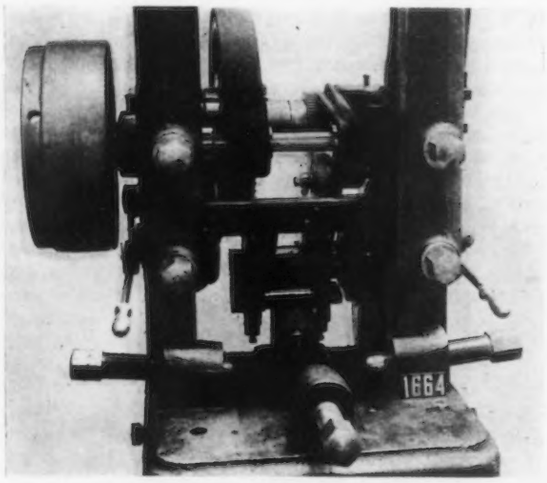
The operator's pedals for brake and for controller reverse drum, which trip to off position when pedal is raised, are spring folded when operator leaves truck. Braking and power application are separate, to provide for incline operation. The lift controller is located beneath the driving motor controller, both being of the drum type.

The platform is a plate of steel with edges bent into a deep skirt, and with heavy angles welded down the middle for attachment to steel support arms. Each arm carries two long-bearinged rollers which bear on heavy section channel uprights fitted with track. The lift is effected by means of a standard Elwell-Parker inclosed type motor with spur gear reduction to double grooved drums carrying steel cable which runs over sheaves at top of uprights to sheaves on elevator carriage to cable equalizer. Cable tension is automatically maintained.

The trail axle, with 10 by 6-in. tires and tapered Timken bearings, is practically the same as that used on the 3-ton machine, since the 26 by 54-in. cantilever type platform load support delivers great pressure to this axle, through the uprights and solid steel bar center sills.

Automatic Roll Feed For Use on Drop Hammer

The Standard Machinery Co., Auburn, R. I., is bringing out an automatic roll feed for use in connection with its automatic drop hammers. It is similar to the feed used on the company's power presses except that on the drop hammer it is in an inverted position in order to clear the poppet screws used for holding



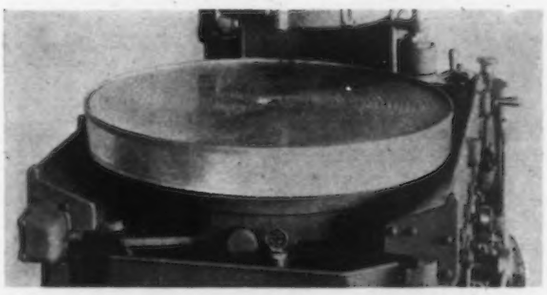
The Feed Is Designed for Use in Embossing Designs on Sheet Stock

the dies in this machine. As on a power press the length of stroke of this feed is controlled by an adjustable eccentric disk mounted on the driving mechanism of the machine.

The feed is designed particularly for use in embossing designs in sheet stock. It is said to increase production 40 to 45 per cent in the hammer operation and to show a like saving in the subsequent trimming operation. The feed acts also as a safety device, the front of the hammer being inclosed by a guard which is not shown in the illustration. This equipment will be on display at the New Haven Machine Tool Exhibition, to be held at New Haven, Conn., Sept. 7-9.

Develops Oversize Magnetic Chuck for Surface Grinder

The Blanchard Machine Co., Cambridge, Mass., has developed for its No. 16 "high-power" surface grinder, a new oversize magnetic chuck, which is 36 in. in diameter. The chuck is built into the machine in place of the standard 26-in. chuck and is not removable. It reduces the vertical range of belted machines to 8



The Chuck Is Built Into the Machine and Is Not Removable. It is for rings up to 36 in. in diameter

in. and the direct motor driven machines to 10 in. The face of the chuck is of the finely divided type, similar to the standard chuck, but is magnetic to the extreme edge. Tapped holes are provided for securing centering stops. One piece steel construction is a feature stressed as assuring both watertightness and durability.

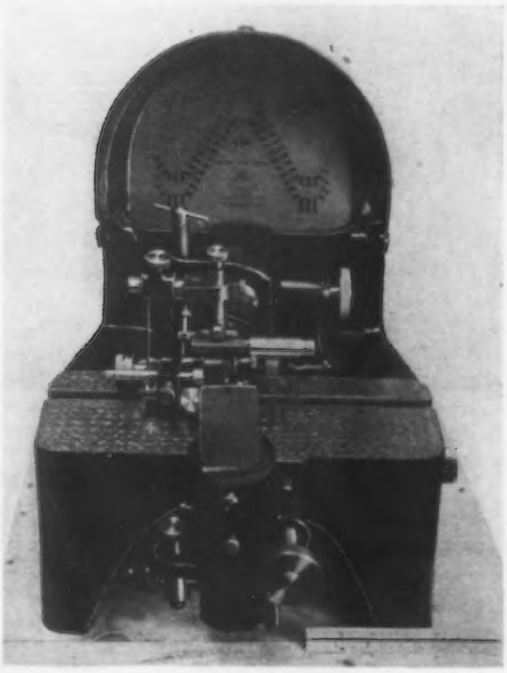
The oversize chuck is intended for rings up to 36 in. in diameter, and for pieces too long or irregular to arrange well on the 26- or 30-inch chucks, as well as for attrition mill plates up to 36 in. It is also suitable for small pieces.

Guards and way covers for this chuck are different from those used with the 26- and 30-in. chucks. Various heights of guards can be furnished to suit the work. By using special large guards and extra height of column with this chuck, the No. 16 grinder will handle large work, such as two cylinder blocks 30⅜ in. x 14½ in. x 14⅝ in. high at the same time.

Universal Screw and Tap Stage for Hartness Comparator

Economies are claimed for a new universal staging attachment for the Hartness screw thread comparator manufactured by the Jones & Lamson Machine Co., Springfield, Vt.

The device has been developed to accommodate a wide range of diameters and pitches of screws and taps. It is made up of a frame carrying rolls on



The New Mounting Fixture Is Universal, and Eliminates a Large Number of Snap, Ring and Lead Gages Previously Required

which the threads are supported at the pitch line, an adjustable back stop for positioning the screw on top, and a spring plunger which holds the screw down on to the roll and back against the stop. The rolls are free to revolve, one being fixed longitudinally in relation to the lens, and the other free to accommodate itself to the thread.

With the adjustments provided, the pitch diameter, lead and form of screws from ¼ in. to 1⅜ in. in diameter, and any pitch from 6 to 28 in the above diameter range, can be tested.

An advantage of this fixture on the comparator is that it is universal, thereby doing away with a large number of snap, ring and lead gages previously required to test a variety of sizes. It is said to reveal all meaurements of a thread as rapidly as the pitch diameter can be tested with a snap gage and to be the only method which simultaneously compares the thread tested with all the elements of a master gage.

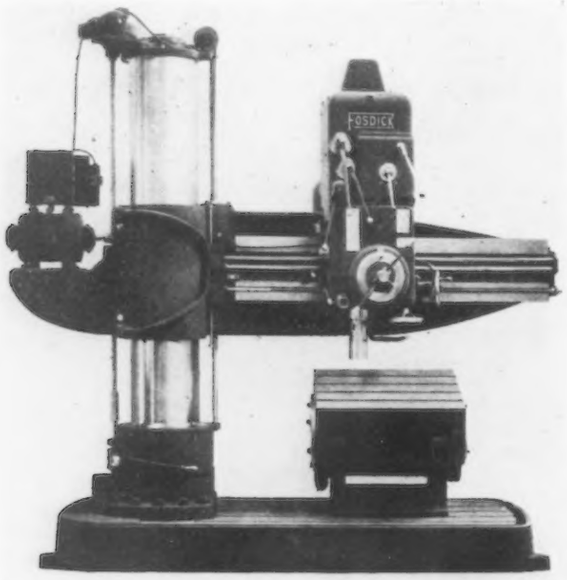
This device will be demonstrated by the company at the National Machine Tool Builders' Association to be held at Cleveland, Sept. 19-23.

Preliminary steps for the erection of a memorial, either in marble or bronze, in honor of Judge Elbert H. Gary, namesake and benefactor of that steel city, have been taken by a committee representing the Gary Chamber of Commerce, Gary, Ind.

Centralized Control Features New Heavy-Duty Radial Drills

Control of all movements at the head is an outstanding feature of a new heavy-duty radial drilling machine which is being placed on the market by the Fosdick Machine Tool Co., Cincinnati. The machines are available in 5, 6 and 7 ft. sizes.

Power rapid traverse to the head is standard equipment on all machines. It is gear connected, is operated from the head, and is arranged so that the handwheel does not revolve when the power rapid traverse is engaged. This unit is lubricated automatically.



Power Rapid Traverse to the Head Is a Standard Feature of the Heavy-Duty Radial Drill Shown Above. There are 36 selective speed changes and 18 feed changes. Control of all movements is from the head

Power column clamping, also standard equipment, is operated from the head by means of a push button. The clamping motor is furnished with the machine and wires from the head to the top of the column are automatically wound-up on a reel. The arm clamp is positively interlocked, and the arm is unclamped, elevated or lowered and clamped again, from the head.

A wide range of spindle speeds, 14 to 1010 r.p.m. or 20 to 1406 r.p.m., is available. There are 36 selective speed changes in the head with only 17 selective sliding gears, speed changes being obtainable through three levers. The gears are of alloy steel, and are hardened. Gears and bearings are lubricated automatically. Eighteen selective feeds are obtained by means of two levers through hardened alloy steel gears of the sliding type. This unit is also lubricated automatically with filtered oil. The feeds range from 0.003 to 0.125 in. per revolution of the spindle and include pipe tap leads for 8—11½ and 14 threads per inch. A safety interlock for feeds at high speed is provided, as well as safety feed knockout.

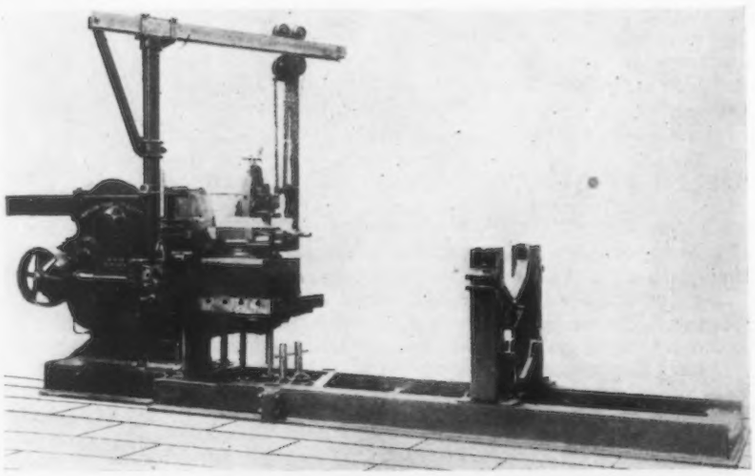
The depth dial is divided into even inches and there is full travel of the spindle without readjusting the depth dial setting. Other features include a multiple-disk friction quick return with spindle nut adjustment from the outside of the head, adjustable spring counter balance for the spindle, and a safety catch to prevent falling of the spindle. Roller bearing spindle sleeve, high pressure lubrication, multiple-splined spindle and Purolator oil filter and a submerged oil pump in the head are other features.

One motor drives the spindle, elevates the arm and operates the power rapid traverse. This motor is of constant-speed type and runs at 1200 r.p.m. or 1800 r.p.m., for spindle speeds of 14 to 1010 r.p.m. or 20 to 1406 r.p.m. respectively. The machines are completely wired, including a circle electrical unit at the top of the column, and wiring through the column to the base for floor connection. Tapered roller and ball bearings are employed from the motor to the spindle nose. Shafts are multiple splined with integral keys.

The arm of the machine is massive, having a double-box and I-beam section. Automatic safety stops and a safety catch are provided for the arm, and the arm barrel is of unusual length. The column is of large diameter. Double clamping surface of the column sleeve is a feature, and a hardened and ground roller bearing race is provided to facilitate swinging of the arm. The base of the machine is of deep box section and has large working surface. The tilting table, of new design, is of liberal dimensions and can be clamped rigidly at any angle.

Combination Heavy-Duty Draw-Cut and Roll Wabble Shaper

Equipment for use in shops manufacturing rolls, and for rolling mills where comparatively few rolls are machined at one time, but where there is a great deal of heavy-duty shaping and planing work, is shown in the accompanying illustration.



The Draw-Cut and Roll Wabble Shaper Is Shown at the Right. The ends of rolls not in excess of 56 in. in diameter and 28 in. in diameter of neck may be machined

This machine, a recent product of the Morton Mfg. Co., Muskegon Heights, Mich., is a combination of the company's 48-in. stroke heavy-duty draw-cut shaper and the roll bed and fixture furnished on the company's previous roll wabble machine. It will machine the ends of rolls not in excess of 56 in. in diameter and 28 in. in diameter of neck. The cutting stroke is 48 in. and the vertical feed, 18 in. The machine can be furnished with 36, 48, or 60 in. of horizontal feed on the cross-rail.

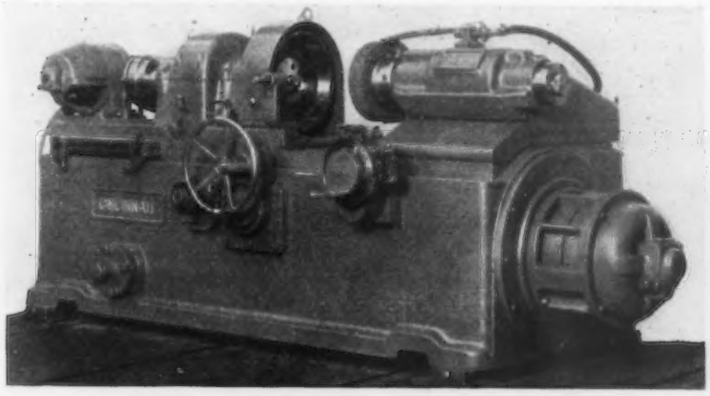
The general construction and operation of this equipment is similar to the company's previous heavy-duty draw-cut shaper, previously announced. It may be converted quickly from a draw-cut to a push-cut shaper for the cutting of pods in the rolls. It is equipped with an auxiliary top plate and a heavy steel vise for general work; also a large T-slotted work table, crane and hoist, tools and holders and a special V-block for holding the rolls. Either belt or motor drive arrangement can be furnished.

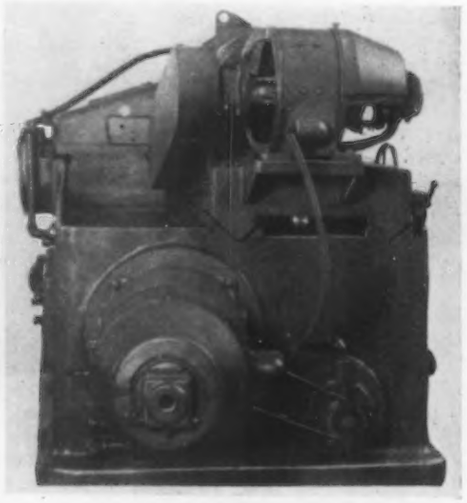
BRAKE DRUM GRINDER

Production of Heat-Treated Steel Drums Stepped Up From 10 to 40 an Hour

INCREASE of production from 10 to 40 an hour in the grinding of brake drums is claimed for the brake drum grinding machine here illustrated, which was developed by Cincinnati Grinders, Inc., Cincinnati.

In this installation drums 18 in. in diameter and 3-in. face are ground, 0.008 in. being removed from the diameter at the rate of 1 min. per drum, actual grinding time. With allowance for normal shop delays and loading and unloading of the work, floor to floor time of 1½ min. per piece is regarded as liberal. This represents 40 pieces an hour. It is stated that the best





The Brake Drum Grinder Is Entirely Self-Contained, the Drive Being by Means of a 30-Hp. Built-In Motor. When direct-current is not available a generator may be attached as shown at right

previous time was 10 per hr., while production at the rate of eight to nine pieces an hour was not unusual.

Carborundum Aloxite wheel is used. The work is held to limits plus-minus 0.003 in., and a good commercial finish is obtained. The brake drums are of heat-treated steel of specifications used by leading automobile manufacturers.

The arrangement of the grinding machine, with the brake drum in place, may be noted from the accompanying illustration. The machine is self-contained, the drive being by means of a 30-hp. motor which is built into the machine, as shown. In order to obtain the greatest possible efficiency from the drive and to assure smoothness, the new Texrope drive has been employed. The spindle of the machine is of unusually heavy proportions in order to eliminate vibration and permit the taking of heavy cuts with the grinding wheel. The wheel is 14 in. in diameter, with a 3-in. face. The machine itself is of massive proportions and weighs 12,500 lb.

Convenience of operation is also a feature stressed. The work is held on a heavy faceplate by means of instantaneously-operated air chucks. Dead stop sizing on the grinding wheel infeed is facilitated by a dial gage permanently located in position. The wheel-truing tool is likewise permanently located. The 2-hp. work-head motor is of the variable-speed type and is controlled by a conveniently located rheostat. Starting and stopping of the work rotation is controlled by means of push buttons, and rotation of the work is stopped instantaneously by means of a dynamic brake. The work saddle is provided with an adjustable dead stop to facilitate positioning of the work in relation to the grinding wheel. All of these factors are stressed as contributing to rapid operation, quick loading and reduction of the effort required by the operator in controlling the machine. The normal operating position is immediately in front of the grinding wheel, where the operator can see the wheel at work and thus have full view of his grinding operation at all times.

A tank is built into the machine and contains a pump which is constantly primed. When direct current is not available a generator may be attached to the machine as shown in the close-up illustration. The machine is entirely electrically controlled.

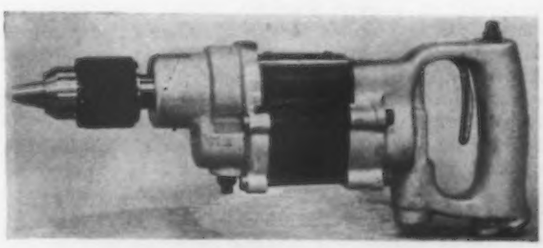
In commenting upon the work for which the machine was designed, it is stated that "increased accuracy and longer life are demanded of brake drums on modern automobiles, and this in turn has led automobile manufacturers to produce their brake drums from a higher grade steel and to heat treat them. This has brought about the necessity of finishing them by the grinding method. Where the drums are produced to close limits of accuracy in the dies, it is quite possible to grind them from the 'black.' However, some manufacturers are turning their drums after they have been heat-treated, and this facilitates the grinding by removing a great deal of the excess stock."

Air Drills With Rotor Type Motor

Three new "high production" air drills, in capacities of ¼, ⅜ and ½ in., respectively, have been brought out by the Rotor Air Tool Co., 5059 Carnegie Avenue, Cleveland, which recently purchased the pneumatic tool division of the Warner & Swasey Co. Unusual power, and maintainance of the correct r.p.m. for the most efficient cutting of metal under the working conditions are claimed for these tools.

The motor is of patented rotor type, consisting of twin eccentric rotors mounted on the spindle which runs in ball bearings, as described in THE IRON AGE of June 23. A special governor controls the free speed of the machine, cutting down the air when running idle and thus reducing the air consumption. The governor opens the air ports as the load on the motor is increased, and it is claimed that the action of this governor automatically maintains the correct cutting speed for the drills.

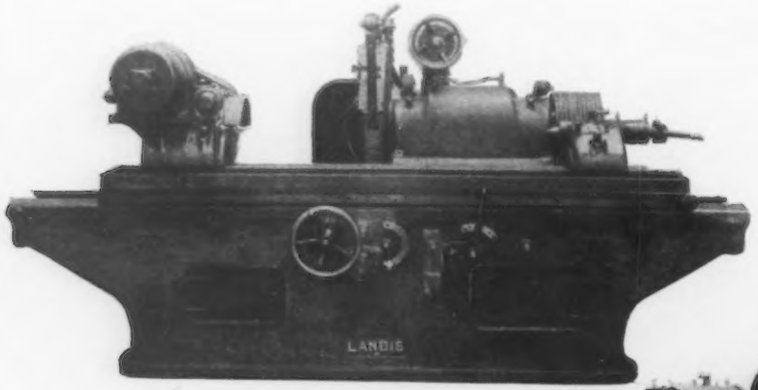
The new drills are designed to permit close corner work. The weight has been kept low by the use of aluminum alloys, the ½-in. drill weighing 7¼ lb., the ⅜-in., 6½ lb. The reduction gearing provides ample wearing surface, with spindles running in ball bearings. A Jacobs chuck is furnished as standard equipment. It is claimed that the maintenance cost of the drill is low, due to the use of the rotor motor, and because the drill may be dismantled by the removal of four outside bolts. The air consumption is said to be low.



IMPROVES LINE OF GRINDERS

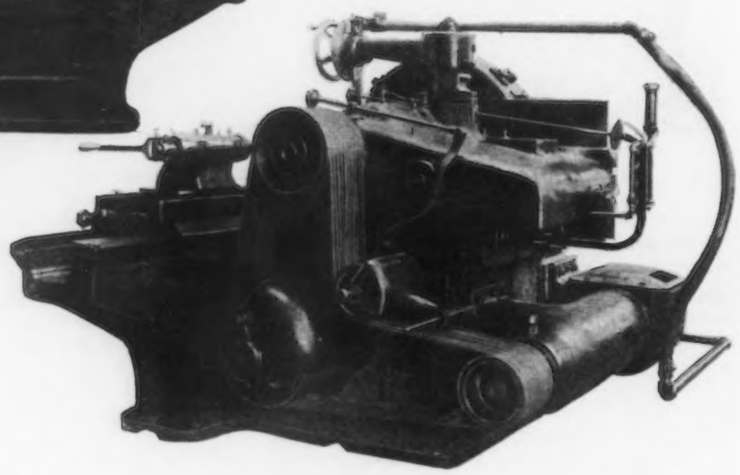
Features Include Variable-Flow Pump, Headstock Motor Drive and Tex-rope Spindle Drive

A NUMBER of improvements have been made during the past three years in the hydraulic type grinding machines built by the Landis Tool Co., Waynesboro, Pa. These grinders are now available in swings of 10, 14, 16, 20, 24 and 28 in., in various lengths and with equipment to take in a large range of work of different character. They are built with equipment for roll grinding, wide wheel or plunge-cut grinding with continuous feed to the wheel head and reciprocating spindle, crankshaft grinding, grinding of railroad work which requires a gap in the table, and all kinds of plain or form grinding.



Hydraulic Power Traverse, Giving Wide Range of Table Speeds; Large Diameter Grinding Wheel and Massive Wheel Head Are Features. The unit shown is the 10 x 52 in. grinder, with hydraulic in-feed to the wheel head

The Spindle Is Driven from the End by a Tex-Rope Drive Arranged as Shown Below



Features of the earlier machines which have been retained in the latest models include hydraulic power traverse, which gives wide range of speeds to the table; large diameter grinding wheel, which is said to have shown economies in wheel cost; massive wheel head with large spindle and bearings with positive lubrication and arrangement for either self-contained motor drive or drive from lineshaft. One of the latest models, a 10 x 52 in. machine with hydraulic power in-feed to the wheel head is shown in the accompanying illustration.

A patented variable-flow oil pump and continuous hydraulic motor, of exclusive Landis design, furnishes the power for traversing the carriage giving a speed range of 12 to 300 in. per min. This pump furnishes only the amount of oil required for any desired traverse speed; if a high traverse is required a larger volume of oil is pumped to the motor than is required when a slow traverse is used. This is stressed as obviating extra duty on the pump, and any heating of the oil. The volume of oil pumped may be controlled conveniently, and the mechanism of both the hydraulic pump and motor is said to be so simple that adjustment is seldom required. As all parts run in oil, no appreciable wear takes place.

The headstock is driven from a self-contained motor which is mounted on top of the headstock as shown in the illustration. The drive is through a Tex-rope to a hardened and ground worm which meshes into a bronze worm gear mounted on the face plate. The motor is of variable-speed type and is carefully balanced to eliminate the possibility of vibration. The work speed is controlled by a rheostat at the front of the machine. An automatic control panel, operated through a limit switch in connection with the start-and-stop lever at the front of the machine, provides sensitive control of the work rotation.

The grinding wheel head, of liberal proportions, is carried on V and flat bearings and the wheel feed is through a screw and nut mounted on the under side of the base, which is emphasized as giving accurate and sensitive movement. The wheel spindle is mounted in large bronze cap bearings which are adjustable for wear and is lubricated automatically from a pump driven by the spindle itself. Provision is also made for positive lubrication of the thrust bearings at all times. The spindle is driven from the end by a Tex-rope drive which permits a change of pulleys to compensate for wheel wear. An idler pulley maintains uniform tension on drive at all times regardless of the diameter of the pulley. The arrangement of the drive may be noted from the rear view illustration, which shows the drive with the guard cover removed. The bracket shown on the rear of the machine is furnished only when the grinders are arranged for lineshaft drive. When arranged for motor drive, the motor is mounted on the rear of the machine with the pulley directly in line with the pulley on the spindle. The motors for the work drive, as well as for the wheel drive, vary in size depending on the size of machine and character of work. The former is variable-speed 500- to 2000-r.p.m., while the wheeldrive motor is of constant speed operating at 1150-r.p.m.

Automotive Accessories Show

A second annual show of the Automotive Accessories Association, 1107 Standard Life Building, Pittsburgh, will be held in Chicago, Nov. 7 to 12. The show will take place in the armory at Sixteenth Street and Michigan Avenue. Space devoted to exhibits will include 22,000 sq. ft., without any interfering posts.

The Akron Barrow Co., 3140 East Sixty-fifth Street, Cleveland, has announced the changing of its name to the General Wheelbarrow Co., effective Sept. 1. The company has operated under the old name since 1840, and operations have been carried on entirely at Cleveland since 1921.

The Truscon Steel Co., Youngstown, Ohio, will have its new Los Angeles plant completed and in operation within the next 30 days. A large warehouse in which fabricating will be done in Boston also is nearing completion. The company is planning an extension to its Chicago warehouse.

Urges Broad Study of Steel Ties

Large Outlet for Steel in the Early Making, Writer Contends, if Question Is Tackled by Industry Properly as Sales-Engineering-Research Job

A STUDY of the history of steel railroad ties would indicate that the railroads, which have accepted many radical improvements and have had some others forced upon them, have in general not condemned steel ties outright, but rather have taken the "show me" attitude and quite properly so. On the other hand, the few large manufacturers of steel who have shown greatest interest in the subject can scarcely be accused of aggressiveness in having their products in the steel tie line placed under practical test in a very broad way, such as might lead to more general adoption.

It is a well recognized fact that no new device, machine or method is so well or so rapidly developed as by practical commercial usage. A comparatively few metal ties have been placed in service in switch yards, in freight line tracks, etc. Some have remained many years; but a large percentage has been replaced with wood ties. Others are still in service after ten to twenty years. This represents commercial usage and tests, which should supply records of some value to the railroad world and to the steel industry. The question is, what action has been taken? What has been accomplished as a result of these tests? The answer would seem to be "very little," as compared to the advance which has taken place in several less important fields for the use of steel.

Has the railroad engineer been given satisfactory answers to comments regarding:

First cost and ultimate cost,
Problems of installation as compared to wood ties,
Tendency to sidecreeping,
Difficulty of maintaining gage,
Probable failure of steel ties due to corrosion,
Rolling or shifting position under sudden braking of fast-moving, heavy trains,
Tendency of tie bolts to loosen under wave strain,
A satisfactory method of insulation for signal systems?

Is the steel industry awake to the fact that:

Of the approximately 26 *billion feet of lumber cut in this country annually, about* 14 *billion feet are consumed by American railroads, and that a large percentage of this goes to meet annual tie replacement requirements?*

That the average annual rail replacement bill of $100,000,000 *or more is generally equalled or exceeded by the expenditure for tie replacements?*

That if 50 *per cent of this tie replacement were supplied in steel, it would increase the steel output over* 2,500,000 *tons per year?*

It is common practice to scoff at any reference to possible timber shortage and call it hysteria. The American Forestry Association in a recently published article states—

> The time has come when facts *must* be stripped of camouflage and spoken plainly.
>
> Our original forests are already two-thirds exhausted and depletion is now proceeding at a rate four times faster than new forests are being grown. Long periods of time will be necessary to raise future timber crops, thus necessitating foresight and immediate action toward reforestation on a scale to meet our astounding demands for wood. *Of all the lumber produced in the world, the United States uses almost one-half.*

Admitting that the supply of lumber today permits the purchase of ties at a price favorable to wood, authoritative statistics show the continually narrowing margin between wood and steel.

How far back do we have to look to the realization and recognition of steel ships, steel office buildings and steel railroad cars, both freight and passenger? And one of the most rapidly growing developments in the building industry today is the advance of the steel frame residence. Each of these developments, now so important to the steel industry, was in the beginning faced with misgivings, groundless fears of corrosion, problems of design, necessity of changing time-proved practices—many of them tenaciously clung to whether good or bad. The steel industry gave scant attention only a few years ago to an infant industry which asked for some recognition and technical help. Not getting it, these visionaries created their own technical organizations, developed their own alloys and handed to the steel manufacturers the automobile business, which represents by far the greatest steel tonnage consumed by any single industry today.

It was not steel, the metal, nor its producers that brought about its adoption in these industries. It was rather the adaptation of steel to jobs being done less well with other materials in other ways.

This adaptation was made possible principally by the architects, engineers, builders and designers who had the vision, courage and ability to do the work and to accomplish results not only better but, in many instances at great financial saving.

Some railroad engineers are seriously studying steel ties. They should have information and assistance. Some state that they are not vitally concerned with the tie situation today. Perhaps they may not be for five or ten years. With the continually increasing weight of railroad equipment, heavier rails, and the undoubted future increase in the cost of wood ties, they realize, however, that just so surely as steel today represents the foundation and structure in the shipping and building world, so will it finally come to the railroads.

Should the free lance inventor, the consulting engineer, the railroad engineer and the track man be depended upon to work out *this* problem also? They may be depended upon to do it; but why should not the engineering brains of the makers of steel and their sales and research organizations apply themselves to the situation with more interest and real activity?

It is not necessary to attempt to tell the railroads their business, but they can be asked a lot of questions. Their answers should be studied, and answers which tell them something should be found for their questions and adverse comments. Not simply replies; but demonstrations indicating an effort to meet their doubts and objections.

If the types of steel ties which have been most used have shown certain faults, catalog and analyze them. Certainly all the evidence thus far developed does not warrant the conclusion that the effort and expense are not justified to strive seriously to produce a satisfactory steel tie.

This is no one-man job. It should not be put up to the engineering departments of the steel manufacturers. It is a sales, engineering, research job calling for vision, energy and team work of all these departments and of the industry as a whole; always with the realization that the continued success of the industry lies in securing for steel the business that belongs to steel rather than attempting by sales effort alone to wrest it from competition which, by virtue of greater foresight and better business management, develops a nearly satisfactory substitute. M. H. C.

Mechanical Engineers to Hold Management Meeting at Rochester

A two-day national meeting of the management division of the American Society of Mechanical Engineers will be held at Rochester, N. Y., Oct. 26 and 27. There will be four sessions, at each of which two papers will be presented. In addition, there will be an evening meeting in charge of the Management Week Committee of Rochester.

"Coordinating Wage Incentives and Production Control" will be the topic discussed at the opening session, Wednesday morning, Oct. 26. Papers will be presented by Oscar Grothe, vice-president White Sewing Machine Co., Cleveland, and vice-president in charge of the production executives division, American Management Association, and by S. C. Hoey, assistant superintendent, Westinghouse Electric & Mfg. Co., East Pittsburgh.

Discussion at the afternoon session, Oct. 26, will center on the subject "Coordinating Quality Control and Production Control." "Control of Quality," a paper by Walter W. Graper, Bausch & Lomb Optical Co., Rochester, will be presented at this session, J. H. Marks, purchasing manager, Packard Motor Co., Detroit, also having a paper. The evening session will be in charge of the Management Week Committee of Rochester, the chairman of which is V. M. Palmer, industrial economy engineer, Eastman Kodak Co.

The major topic of the opening session Thursday morning, Oct. 27, will be "Economic Problems in Production." Two papers are planned, one being "How to Determine Expenditure in Material Handling Equipment," by George E. Hagemann, assistant editor, *Manufacturing Industries*, New York. The other, by F. E. Raymond, Crosby Steam Gage & Valve Co., Charleston, Mass., is on the subject of "How to Determine the Economic Lot Sizes."

"Plant Location" will be the topic at the afternoon session, Oct. 27. Papers planned include: "Factors to Be Considered in Plant Location," by Tyler S. Rogers, district manager, Ballinger Co., Philadelphia, and "Examples of Plant Location," by Emmett N. Carter, consulting engineer, New York. C. W. Lytle, director of industrial cooperation, New York University, New York, is chairman of the management division of the A.S.M.E.

"Exit" Interviews with Employees Promote Good Will

Some corporations spend thousands of dollars each year in good will advertising, while they give little attention to winning the good will of departing employees, says the Policyholders Service Bureau of the Metropolitan Life Insurance Co., New York, in a preface report, entitled "The Exit Interview." This pamphlet, which is the second of a series on labor turnover, is based on a study of the practices of 60 companies that interview people leaving their employ.

The interview, the report says, should learn the reasons for an employee's seeking work elsewhere and, at the same time, should give him pertinent information about the policies of the company, the opportunities it offers and ways of taking advantage of them. While the interviews are believed to win good will for the employer, they have not been notably successful in reducing labor turnover. One large company reported that 4600 discharged, laid off and quitting employees had been interviewed during the first 11 months of 1926. Of these, only 195, or 4.2 per cent, were saved as a result of the interview. The real problem is to get in touch with the employee immediately at the time of quitting. Frequently it is not known that an employee is leaving until he has been absent two or three days.

A corollary advantage of the exit interview is that it frequently discloses unsatisfactory working conditions in certain departments, of which the management may not be aware.

COMING MEETINGS

September

Empire Mining and Metallurgical Congress. Aug. 22 to Sept. 20. Second Empire congress, meetings held at various places in Canada. R. O. Wheatley, 627 Drummond Building, Montreal, associate secretary.

Conference on Human Relations in Industry, Industrial Department, Young Men's Christian Association. Sept. 1 to 4. Tenth annual conference, Silver Bay on Lake George, New York. Fred H. Rindge, Jr., 347 Madison Avenue, New York, executive secretary in charge of arrangements.

International Foundry Exhibition and Congress. Sept. 1 to 21. Exhibition at Parc des Expositions, Paris. Comité d'Organization, 8 Rue de la Victoire, Paris, France.

American Electrochemical Society. Sept. 4 to 20. Fall meeting, Northwestern trip starting from Chicago. Colin G. Fink, Columbia University, New York, secretary.

New Haven Machine Tool Exhibition. Sept. 6 to 9. Seventh annual exhibit, Mason Laboratory, Yale University, New Haven, Conn. Harry R. Westcott, 400 Temple Street, New Haven, Conn., chairman exhibition committee.

International Congress for Testing Materials. Sept. 12 to 17. Amsterdam, Holland.

American Refractories Institute. Sept. 15. Fall meeting, Clifton Hotel, Niagara Falls, Canada. Dorothy A. Texter, 2202 Oliver Building, Pittsburgh, secretary.

Concrete Reinforcing Steel Institute. Sept. 19 to 21. Semi-annual meeting, Aviation Country Club, 20 miles from Detroit. M. A. Beeman, Tribune Tower, Chicago, secretary.

American Welding Society. Sept. 19 to 23. Fall meeting, Book Cadillac Hotel, Detroit. M. M. Kelly, 33 West Thirty-ninth Street, New York, secretary.

National Machine Tool Builders' Association. Sept. 19 to 24. First national machine tool builders' exposition, Public Auditorium, Cleveland. E. F. DuBrul, 817 Provident Bank Building, Cincinnati, manager.

American Society for Steel Treating. Sept. 19 to 24. National steel and machine tool exposition at Convention Hall, technical sessions at Statler Hotel, Detroit. W. H. Eisenman, 4600 Prospect Avenue, Cleveland, secretary.

American Institute of Mining and Metallurgical Engineers, Institute of Metals. Sept. 19 to 24. Annual meeting, Statler Hotel, Detroit. H. Foster Bain, 29 West Thirty-ninth Street, New York, secretary.

Society of Automotive Engineers. Sept. 19 to 22. Production meeting, Sept. 19 and 20, Hotel Winton, Cleveland; Sept. 21 and 22, Book Cadillac Hotel, Detroit. C. F. Clarkson, 29 West Thirty-ninth Street, New York, general manager.

National Association Ornamental Iron and Bronze Manufacturers. Sept. 20 to 22. Annual meeting, West Baden, Ind. A. L. Graham, 195 Platt Street, Rochester, N. Y., secretary.

Iron and Steel Institute. Sept. 20 to 23. Annual autumn meeting, Royal Technical College, Glasgow, Scotland. G. C. Lloyd, 28 Victoria Street, London, S. W. 1, secretary.

Small Loss in August Iron Output

Estimates, Gathered by Wire, Show Daily Rate Only 484 Tons, or 0.5 Per Cent Less Than July— Net Loss of 3 Furnaces

ACCORDING to data gathered by wire on Tuesday, Aug. 30, the estimated pig iron production for August was 2,936,150 gross tons, or 94,715 tons per day. These figures include estimates of the output for the last two or three days of the month by the companies sending in the returns. It was necessary to estimate in this office the production of only seven furnaces.

The estimated August output of 94,715 tons per day compares with 95,199 tons per day in July—a loss of only 484 tons in the daily rate, or about one-half of 1 per cent. A year ago the August daily rate was 103,241 tons. It was larger than the daily rates in August of 1924 or 1925.

Net Loss of Three Furnaces

Operations in August showed a net loss of only three furnaces—8 were blown out or banked and 5 were blown in. The Steel Corporation and independent steel companies are each credited with a loss of 3 furnaces, while 2 merchant furnaces stopped operating. The five furnaces blown in included four independent steel company stacks and one Steel Corporation furnace.

At the end of August 187 furnaces were in blast, as compared with 190 on Aug. 1.

Furnaces Blown In and Out

Among the furnaces blown in during August were one furnace at the Steelton plant of the Bethlehem Steel Corporation in the Lower Susquehanna Valley; one Aliquippa furnace of the Jones & Laughlin Steel Corporation and one furnace of the Pittsburgh Crucible Steel Co. in the Pittsburgh district; one furnace of the Colorado Fuel & Iron Co. in Colorado and one Bessemer furnace of the Tennessee Coal, Iron & Railroad Co. in Alabama.

Among the furnaces blown out or banked during August were one furnace of Witherbee, Sherman & Co. in New York; one furnace at the Steelton plant of the Bethlehem Steel Corporation in the Lower Susquehanna Valley; one Mingo furnace of the Carnegie Steel Co. in the Wheeling district; one Gary furnace in the Chicago district; one furnace of the Colorado Fuel & Iron Co. in Colorado and one furnace of the Sloss-Sheffield Steel & Iron Co. in Alabama.

Production by Districts

The estimated August production by districts is given in the table. The actual output for August will be published in THE IRON AGE, Sept. 8.

Pig Iron Production by Districts, Gross Tons

	Aug. (31 days)	July (31 days)	June (30 days)	May (31 days)
New York and Mass.	231,339	226,700	216,194	227,105
Lehigh Valley	88,422	84,429	84,388	87,198
Schuylkill Valley	36,389	52,510	58,224	74,892
Lower Susq. and Lebanon Valleys.	30,548	27,173	30,300	41,274
Pittsburgh district	578,234	534,610	573,967	680,858
Shenango Valley	98,470	105,136	118,233	123,075
Western Penna.	96,776	97,399	98,676	116,771
Maryland, Virginia and Kentucky	95,191	96,070	96,676	106,601
Wheeling district	129,945	136,265	136,251	150,487
Mahoning Valley	264,984	263,456	272,834	275,904
Central and Northern Ohio	327,433	340,306	340,810	346,620
Southern Ohio	26,960	32,479	41,828	43,995
Illinois and Indiana	571,637	587,755	649,019	705,759
Mich., Minn., Mo., Wis., Colo. and Utah	139,519	146,938	140,507	147,755
Alabama	208,994	208,739	220,230	250,456
Tennessee	11,309	11,195	11,514	12,190
Total	2,936,150	2,951,160	3,089,651	3,390,940

Ten Per Cent Higher List Prices Charged on Broken Lots of Bolts and Nuts

Standard methods of packing bolts and nuts have been adopted by all American manufacturers for a period of one year from July 1, 1927. Eighteen standard sizes of packing cases, six standard sizes of cartons and three standard sizes of kegs are now being employed. Lists of standard container quantities have been issued by the manufacturers, and for less than those specified quantities 10 per cent higher list prices are being charged. Heretofore no extra was charged on less than standard container quantities except on nuts, on which a net extra of $1 was charged for each size.

The packing lists cover carriage bolts, machine bolts, lag bolts, common nuts, cold-pressed common nuts, hot-pressed square and hexagon nuts, cold-pressed square and hexagon nuts, cold-pressed semi-finished hexagon nuts, S. A. E. hexagon semi-finished nuts, S. A. E. hexagon castellated nuts, United States Standard hot-pressed and cold-pressed tapped nuts and U. S. Standard semi-finished hexagon tapped nuts.

The gross weight and the number of pieces packed are shown for each of the standard container quantities in the lists. One result of standardized packing is that small diameter bolts in short lengths are packed in smaller quantities than was formerly the practice with most manufacturers.

The program calling for standard sizes of containers was adopted at Washington, March 23, at a general conference of producers, distributers and users of bolts and nuts under the auspices of the national committee of metals utilization, Department of Commerce.

Rogers Brown & Crocker Brothers Get Hanna Agency

The Hanna Furnace Co., Cleveland, has authorized the sale of its well known "Buffalo" brand of pig iron by Rogers Brown & Crocker Brothers, Inc., in New England, New Jersey and contiguous territory.

*Schedule of the next installments of the **Business Analysis and Forecast**, by Dr. Lewis H. Haney, Director of New York University Bureau of Business Research, follows: **Sept. 15**—Activity in Steel Consuming Industries; **Sept. 22**—Position of Iron and Steel Producers; **Sept. 29**—General Business Outlook.*

CONTENTS

September 1, 1927

Proper Fusing of Enamel Vital 531

Finished Steel in World Exports 536

Core Room of Packard Plant 539

Iron and Steel Centers in France 540

Reversing Blooming Mill Practice 543

Urges Broad Study of Steel Ties 559

Pig Iron Production Slightly Lower in August 561

Exports Higher and Imports Lower 595

Large Shipment of Rolling Mill Equipment 534
Factors Affecting Total Carbon in Steel 535
Lowest and Slowest Locomotive Ever Built 542
Tin Supply for American Consumers... 545
Avoid Accidents by "Burying" Carelessness 547
Merger of Handling Equipment Makers 548
Heald Machine Co. Expands..... 550
New Cranes at Alliance Plant..... 551
"Exit" Interviews with Employees.... 560
Ten Per Cent Higher List Price Charged on Broken Lots of Bolts and Nuts.... 561
Industrial Research in the United States 567
Large Track Bolts Put on List and Discount Basis..... 579
Weirton Steel Expansion..... 585
New Wage Doctrine..... 585
Industrial Finance..... 588
Strikes Diminishing in Germany..... 593
Trade Piracy Penalized in Japan..... 593
American Engineering Standards Committee 596
Pig Iron Made in New Zealand..... 599
Stainless Steel for Electric Welding.... 600

MEETINGS

Automotive Accessories Show..... 558
Coming Meetings..... 560
Mechanical Engineers in Rochester..... 560
Machine Tool Congress..... 600
Automotive Engineers' Production Meeting 600

NEW EQUIPMENT

High-Strength Cap Screws..... 548
Gleason Planing Generator..... 549
Flat Surfaces Finished by Broaching.... 550
Large Cylindrical Grinder..... 551
Turret Lathe for Medium Size Work... 552
Improves Internal Grinder..... 552
Pipe-Threading and Cutting Machine... 553
14-In. Geared-Head Engine Lathe..... 554
Reversing Pump for Machine Tools.... 554
Light Tiering Tructor..... 554
Automatic Roll Feed for Drop Hammer 555
Oversize Magnetic Chuck..... 555
Universal Screw and Tap Stage..... 555
Heavy-Duty Radial Drills..... 556
Combination Heavy-Duty Draw-Cut and Wabble Shaper..... 556
Brake Drum Grinder..... 557
Air Drills With Rotor-Type Motor..... 557
Improves Line of Grinders..... 558

STATISTICAL

Canadian Iron and Steel Output..... 593
Larger Imports of Iron Ore..... 594
Fabricated Steel Plate Bookings..... 594
Stocks of Industrial Coal..... 594
Fluorspar Mined in United States..... 594
Where Steel Exports Went..... 596
Institute's Statistical Report..... 596
Reduction in Malleable Castings..... 596
Manufacture of Electrical Machinery... 596
Foundry Equipment Sales..... 599
Iron Production in Australia and New Zealand 599

DEPARTMENTS

Editorial 564
Iron and Steel Markets 568
Comparison of Prices..... 569
Prices, Raw and Finished Products..571-573
Non-Ferrous Metals..... 586
Structural Awards and Projects..... 587
Railroad Equipment Buying..... 588
Reinforcing Steel Business..... 588
Personals 589
Obituary 590
European Steel Markets..... 591
Machinery Markets..... 601

This Issue in Brief

Ventilation of core room shut off from window space is accomplished by overhead unit heaters and blowers. In Packard core room the equipment is located above the core makers' benches. Air comes out of openings near the floor line. Dampers make it possible to obtain best distribution.—Page 538.

Enameling costs are cut by adopting automatic temperature control, enabling common labor to perform work formerly done by skilled labor. Wastage of heat, due to uncontrolled irregularity in heat and burning periods, is also avoided in gas stove plant.—Page 533.

Total carbon in pig iron is reduced by lower crucible temperatures in the blast furnace. To get low carbon iron it is necessary to run slags richer in silica and iron oxide, with lower temperature ranges.—Page 535.

World export trade has not kept pace with production. New tariff policies and intense nationalism have militated against exchange of goods between countries. While world production of all commodities increased 17 per cent between 1912 and 1925, total trade gained only 5 per cent.—Page 536.

For 700 years French steel mill has been in continuous operation. Allevard plant is one of the oldest steel mills in the world.—Page 540.

Tin resources will be exhausted rapidly after ten years, Guggenheim engineer predicts. Believes that production will continue at present rate of approximately 144,000 gross tons per year for about ten years. After that a virtually complete exhaustion of tin resources will be approached, with no limit to levels to which prices will rise. However, this prediction does not take into account the possible discovery of new methods of working low grade deposits. —Page 546.

Chinese boycott of Japanese products diverts business to American mills. American sheet and pipe manufacturers are profiting by the boycott. Outlook for Chinese business for the remainder of the year is good.—Page 593.

Coal stocks are shrinking. August 1 industrial reserves in United States and Canada totaled 58,448,000 net tons, which was 7 per cent below the July 1 figure.—Page 594.

First few passes in blooming mill should be light. Heavy pressures should not be applied until the ingot has been compressed on all four sides, providing an outer envelope strong enough to resist corner-cracking.—Page 545.

Exports of iron and steel gain while imports fall off. July shipments totaled 190,502 tons, an increase of 3 per cent over June. July imports were 61,112 tons, 12 per cent under June.—Page 595.

Sinking japanning tanks to floor level facilitates dipping and increases production. Gas stove manufacturer suspends parts from racks conveyed on overhead track. Racks are run directly into ovens after immersion, and parts are baked at 450 deg. Fahr. for 50 min.—Page 534.

From ingot to finished product without reheating. New Bethlehem mill will roll 12-ton ingots into finished strip before original heat leaves the steel.—Page 534.

Pleads for joint investigation of steel-tie question. With forest reserves rapidly being depleted, and railroads using a large portion of annual lumber consumption for tie replacements, writer suggests that the time has come for the steel industry and railroads to join hands in an exhaustive study of the problem.—Page 559.

August automobile output is expected to exceed July by 10 per cent. Detroit believes that motor car sales and production have been checked because the trade is waiting for the new Ford models. It is doubtful whether Ford will be in production in a large way before October at the earliest.—Pages 550 and 584.

Are "exit" interviews with employees who are leaving jobs worth while? While labor turnover is not directly reduced thereby, these interviews frequently lead to the discovery of conditions which cause high labor turnover.—Page 560.

Not higher wages, nor lower wages, but unchanging wages are what continued prosperity demands, says manufacturer. Increasing wages has its effects no less harmful than decreasing wages. Advances call for more money to do business, and for extended credits, leading to a condition very similar to that caused by wage cuts, says F. C. Biggert.—Page 585.

"Sixty per cent" formula as a gage of normality in iron industry is faulty. The small, high-cost furnaces are steadily disappearing, and average capacity is mounting. Thus the capacity figure, rather than the number of furnaces operating, is the proper measure of the condition of the pig iron industry.—Page 565.

Steel industry is far from a leader in industrial research. Twenty - five manufacturing firms in other lines of industry employ more research workers than does the largest steel producer.—Page 567.

Pig iron output declined slightly in August, according to estimates. Average was 94,715 tons per day (estimated), 481 tons under the July daily average. At end of month 187 furnaces were in blast, three less than on July 31.—Page 561.

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Physical Improvement of Railroads

THAT the railroads have been light buyers of freight cars and locomotives since 1924, and are light buyers of rails this year, should be regarded as evidence of the good physical condition of their lines. It is not indicative of decreased traffic requirements or of lack of disposition or ability of railroad companies to keep the properties fit.

Seeing that the transportation industry is exposed to possibilities of hostile legislation the unfavorable facts in railroading have been brought to public attention while there has been less occasion to stress correspondingly the favorable facts. The issue as to government ownership or operation has also had its influence.

The year 1916 was the last "good" year for the railroads in the old order of things. In that year there were improvements of all sorts, and the length of new line built exceeded the length of line abandoned, though by only a small margin, indicating that even under prosperity the occasion for much building of new line had largely disappeared. In each of the next nine years the abandonments exceeded the new mileage constructed, while 1925 showed only a small excess of new construction, and 1926 only a few hundred miles.

The stressing of these abandonments tended to cover the fact that quite a good bit of new track was constructed. Statistics we here cite are of Classes I, II and III, as reported by the Interstate Commerce Commission, not the statistics merely of Class I roads. Since the end of 1916 there has been a decrease of only a small fraction of one per cent in the mileage operated. The number of miles of second, third and fourth main line track has increased 19.3 per cent, yard and siding track has increased 14.9 per cent, and all track has increased 5.3 per cent.

There have been substantial increases in equipment. While the number of locomotives increased only 3.7 per cent, the average tractive power per locomotive increased 22.8 per cent and the total tractive power increased 27 per cent. The number of freight cars increased only 3.7 per cent, but the average capacity increased 9.3 per cent and the total carrying capacity 13.5 per cent.

The revenue ton-mileage increased in the same proportion as the freight car capacity, suggesting in general that there was no greater loading of cars relative to their capacity, and bringing out the point that locomotive power increased fully 10 per cent relative to the total amount of service required.

The public realizes much better than it did a few years ago that railroad prosperity benefits the country much more by furnishing expeditious and trustworthy service than by supplying large orders for materials and equipment. The time is past when any one is likely to view poor railroad service with a measure of satisfaction on the ground that it is likely to bring about "more railroad buying." Such a feeling did exist at one time.

It is quite true that there has been a relatively small growth of railroad facilities, in point of percentage, in the past ten years as compared with growth in previous decades. But traffic requirements could not be expected to increase at the old gait, when the railroads were engaged in getting into the field. For a long time freight ton-mileage increased at a rate that brought a doubling once in each dozen years. The recent pace has been such as to represent a doubling in four times that period. There is opportunity to render still better service, when less expansion is required.

Small Furnaces Disappearing

MANY a time in the past 25 years writers on iron market changes have told of the diminishing field of the merchant blast furnace and at the same time have predicted the elimination of many furnaces of small output and high cost. These latter predictions have been borne out, each year yielding its toll of furnaces that have been abandoned or actually demolished. At the same time the average daily output of active furnaces

has risen. As new furnaces have been built the standard of capacity has gone higher and 700 tons as a daily rating is as common today as a 400-ton rating not many years back. Taking Aug. 1 as a reckoning date and using 1914 as the basis of comparison, the showing for 1925, 1926 and 1927 has been as follows:

Date	In Blast	Daily Estimated Capacity, Tons	Capacity per Furnace, Tons
Aug. 1, 1914....	188	63,935	340
Aug. 1, 1925....	190	86,420	455
Aug. 1, 1926....	216	102,100	472
Aug. 1, 1927....	190	93,700	493

It happens that this year and 1925 had the same number of active furnaces on Aug. 1, and for 1914 the figure was but two less. From 340 tons in 1914 the average daily output in 1925 on Aug. 1 was 455 tons, or 105 tons greater. By another year the average had gone up 17 tons and by Aug. 1 of this year there had been a further gain of 21. It is plain, therefore, that the capacity figure, rather the *number* of furnaces active, is the proper measure of the condition of the pig iron industry. A formula that takes 60 or any other percentage of the number of furnaces in the country as an index of normal operation is faulty, in view of the very marked increase in recent years in output per furnace and the invariable rise in the average daily output per furnace as the number of furnaces in blast decreases.

The more recent mortality among the smaller furnaces is shown in the American Iron and Steel Institute's listing of 401 coke furnaces at the close of 1924 and of 363, or 38 less, at the close of 1926. The institute notes that 29 out of the 363 have long been idle and the probabilities are that few of them, if any, will ever run again.

The Health Factor in the Shop

THROUGH the Associated Industries of Massachusetts a campaign has been organized for the promotion of health in the industrial plants of the State. It is based on the belief that while much has been done in this field there remains much to be learned and put in actual practice. The Associated Industries has 1600 member firms, employing 450,000 persons who constitute 75 per cent of the industrial employees of the State. A committee has held several meetings with specialists in industrial hygiene, and the results have been so worth while that one of the sessions of the association's annual meeting in October will be given over to this subject.

Great advances have been made in recent years in attention to the well-being of workers. More and more this policy is seen to be essential to profitable operation. It has increased the productivity and lengthened the useful life of the average individual employee, reduced lost time from accident or sickness, lowered the labor turnover, and improved the shop morale. Ventilation, lighting, cleanliness, disease-prevention have been carried far in a large percentage of the successful industrial works of the country. The same is true of safeguarding against accidents and of the treatment of injured employees. On the surgical and medical side a standard practice has been established. The works physician has made a place for himself in the industrial economy, and with him have come compulsory physical examination and the visiting nurse.

But knowledge of the care of workers' health by no means has reached its limit. In particular, much remains to be learned and done in the broad field of mental health in industry, taking in that knottiest of problems, group morale. This has an important place in the work of the Massachusetts committee. In an outline of its activities in this direction it is pointed out that in the beginning we had various independent movements based on cold theory. There was the psychologist who believed that accurate determination of fitness for a job depended on the development of tests of the applicant's ability. There was the vocational counsellor whose point of view was that the individual must be studied and understood, and then he could be fitted into the ideal job for his particular make-up. There was the psychiatrist, whose major premise was that poor adjustment to the job lay in abnormalities which the physician could correct. In fact, the scientific theorist made the shop his laboratory.

But out of all this theory there was evolved a basis of sound practice. The result is a system in which the employment bureau, the efficiency man, the foreman and the physician are able to coordinate their efforts. In a sense the process is now a refining one. The Boston movement, vigorously pushed, as it is, will add to the total knowledge of a great subject, and particularly to the application of that knowledge. At the same time it should stimulate interest among the large membership of the associated industries and others who have not been fully alive to this major phase of the human factor in industry.

Government Is Wasteful

LOCAL governments in the United States could save about 10 per cent in the cost of their affairs, the National Industrial Conference Board reports, if they should conduct themselves on good business principles rather than political. The board finds that this would come to a total annual saving of about half a billion dollars. Without being in any way critical of this estimate, seeing that the investigators have reasons while we have only impressions, the conclusion strikes us as being conservative.

We have in mind an expert administrator for a city of fair size, less than 100 miles away from New York, who although a professional politician was in every way qualified to be a city business manager, and who was quite frank in his conversations with personal friends in saying that he could run his city for 25 per cent less money if he were free from all political influences.

On the other hand, we are familiar with the conduct of affairs in small towns, especially in New England, where all important expenditures are discussed in town meeting, in the primitive way, and are considered as coming directly out of the pockets of everybody. Such communities, however, are subject to the levies upon them by the county, with which extravagance and irresponsibility are likely to begin, and by the State government which is even more remote.

Of course, we are all aware that in the administration of our cities, beginning with those that are quite small, business principles seldom obtain. For that reason government by commis-

sion or by an appointed manager has been resorted to, but that movement has not yet made any great progress.

Speculating on these conditions, we should not be surprised to ascertain that a waste of more than 10 per cent might be eliminated from the cost of State, county, municipal and town government. For that matter, a large waste may be excised from the cost of Federal Government, which is not to depreciate what President Coolidge has accomplished in that direction. We bear in mind what Senator Aldrich said in respect to the subject, into which he looked deeply. The executive has obviously no control over the extravagance of Congress and it has to bow deeply to bureaucratic assumptions and wishes.

The economy that has been effected in all Federal affairs has been largely the result of the change from war basis to peace basis. We may still deplore that the scandalous waste of our marine adventure goes on, and that there has been no real accomplishment in coordinating and consolidating the bureaus.

Steel Leadership in Coke

FOR six years the steel industry has fully maintained its leadership in the by-product coking industry. In 1920 blast furnace interests made 81.8 per cent of all the by-product coke made in the United States, while in 1926, according to the final by-product report just issued, the proportion was 82.7 per cent. During the six years the production of by-product coke increased 44 per cent.

As has been pointed out before in these columns, according to certain general principles the steel industry should be slow, relative to public utilities or private enterprise, in adopting by-product coking. The steel industry's requirements vary greatly, while by-product coking is something that should be at a uniform pace, and the public requirements, or what should be the requirements, in house heating, gas making, etc., are relatively constant. By far the major part of our soft coal output should be put through the by-product process. Less than 15 per cent of all the soft coal produced last year was coked by any process.

The steel industry, however, had the courage and the capital or credit to embark rapidly in by-product coking. Now it has not much further to go as already the great bulk of its coke is by-product. Yet an enormous field is left for by-product coking, to supply coke for domestic and industrial use.

Distribution of the by-product coke output last year was as follows:

	Net Tons
Used by producers in blast furnaces, etc....	31,334,305
Sold to affiliated corporations for blast furnace use	2,127,176
Merchant sales for blast furnace use.....	1,566,980
Sold for foundry use	2,168,017
Sold for domestic use	5,056,568
Sold for industrial and other use.....	1,662,837
Total disposal	43,915,883

The disposal naturally differs slightly from production in the year, which was 44,376,586 net tons.

The total for blast furnace use was approximately 35,000,000 tons, the figures as given in the table presumably including a little coke used in miscellaneous ways at blast furnace plants.

In a statement prepared early last year by the Bureau of Mines it was shown that in 1923 approximately 52,344,000 net tons of anthracite and 66,400,000 net tons of bituminous coal were sold for domestic use. Last year's total coal production was slightly larger, and one may take it that about 120,000,000 net tons of anthracite and bituminous coal were sold for domestic use.

By comparison the 5,000,000 tons of domestic by-product coke seems quite small, with all the time there has been for growth. Assuredly if this country is to use its brains, energy and capital for economic ends there will be a great increase in by-product coking for the public. If private enterprise and public utilities do not take hold in the large way that is dictated, it may well be that the steel industry will go further along this line—for already it is doing something—and supply no little coke to the public.

In the past ten years the growth of by-product coke has been almost entirely at the expense of beehive, total coke production being almost stationary. As against 35 per cent in 1916, by-product coke was 79 per cent of the total last year.

Tool Steel from Sponge Iron

MUCH has been said about sponge and granular iron and the superior quality of the steel made from it; but the substitution of such material for scrap steel in making tool steels is a novel development.

Sponge iron, said to be unusually pure, is now being imported into the United States from a foreign plant where about 1000 tons is the monthly production, and is being used by some American electric tool steel producers for conversion into high-grade tool steels. It is being melted in preference to scrap, though the latter can be obtained at much less cost, because the quality of the steel produced is said to be so much superior to that made from other raw material as to justify the larger outlay. The suggestion is made in this connection that all steel made from granular iron or other product of a direct-from-the-ore process has properties that distinguish it from that made from pig iron in the usual present-day manner. Undoubtedly iron which has not passed through a blast furnace is less contaminated than iron made by gaseous or similar reduction with coke and ore in contact. As a base it should be superior to scrap and should result in a better steel.

The claims for the direct process, particularly as regards its cost, will be nearer a determination when the large commercial plant now nearing completion at Lorain, Ohio, is on a production basis. However, the experience with tool steel would seem to favor the larger project from a quality standpoint.

No Change in Bar Iron Mill Scales

The average price of bar iron shipments during the past 60 days was disclosed at 1.95c. per lb. in the bimonthly examination of the sales records of manufacturers signing the wage scale of the Amalgamated Association of Iron, Steel and Tin Workers. This is the same price as in the previous 60 days and accordingly there will be no change in wages for the next 60 days. The boiling rate on a 1.95c. sales price is $11.55 per ton. Prior to the new scale agreed upon for the 1927-28 wage year, that price would have meant a boiling charge of $11.13 a ton.

A *Picture of Industrial Research in the United States—Steel Is Not Conspicuous*

A LIST of industrial research laboratories maintained by commercial organizations in the United States has just been issued by the National Research Council, containing data from which a general survey of such activities may be made. The book contains not only the name of the director, but also the number of men engaged, and brief notes on the principal researches in progress. Just 1000 laboratories sent in reports, and in these a grand total of 14,345 men are engaged whole time.

Doubtless a wide variety of interpretations has been given to the words "industrial research" by the informants, and furthermore the small army of men enrolled contains every rank from commanding general to kitchen police. It is also true that 10 laboratories may not accomplish ten times the useful work of one, nor the 2000 men in the Bell Telephone Laboratories necessarily increase the balance sheet 40 times as much as the 52 men engaged by the Aluminum Co. Nevertheless, with these limitations in view, an analysis of the returns should indicate broadly the places where investigations are most frequent, and progress most likely.

First is given a list of companies holding highest rank, as measured by numbers of research workers:

Bell Telephone Laboratories	2,000
E. I. duPont de Nemours & Co	943
General Electric Co	672
International Harvester Co	619
Goodyear Tire & Rubber Co	484
General Motors Research Laboratories	335
Westinghouse Electric & Mfg. Co	329
Union Carbide & Carbon Corporation	315
Thomas A. Edison Laboratories	250
B. F. Goodrich Co	236
United States Rubber Co	151
Chrysler Corporation	144
Eastman Kodak Co	142
Standard Oil Co. of California	142
Underwriters' Laboratories	140
Mellon Institute of Industrial Research	124
Hercules Powder Co	107
Dow Chemical Co	105
Newport Co. (colors)	99
Universal Oil Products Co	93
The Brown Co. (paper)	90
Atlantic Refining Co	82
Bakelite Corporation	74
C. F. Burgess Laboratories (forest products)	72
Procter & Gamble (soap)	66
United States Steel Corporation	66
New Jersey Zinc Co	62
New York Edison Co	60
Silica Gel Corporation	59
Pittsburgh Plate Glass Co	56
Aluminum Co. of America	52
Firestone Tire & Rubber Co	50

The list has been made unduly long in order to include one steel producer. While it should be remarked that the figure for the Steel Corporation is undoubtedly low (for the Carnegie Steel Co. did not report its personnel) yet it brings out strikingly the relative disproportion between size of corporation and research activities of others in the list. We may expect that under the direction of Dr. John Johnston, head of the newly created Department of Research and Technology, this will become adjusted.

As a matter of fact, others in the iron and steel industry cannot fairly point a finger at the corporation's four laboratories and 66 workers. All the other steel producers together maintain only 27 research laboratories and 164 workers, and the iron and steel foundries 16 research laboratories with 55 workers. This makes a total of 47 laboratories with 285 workers, an average of 6 men per laboratory. The tabulation shows not only that there are relatively few iron and steel laboratories, but they are small. Compare these figures with those for non-ferrous metallurgy (74 laboratories employing 583 men—8 men each). An even better record is attained by the automobile and parts manufacturers, with their 45 research laboratories and 810 men, and by the machinery manufacturers with 114 laboratories and 1645 men.

Listing the data by major industries is interesting. Including the above we have:

Metal Trades—	Laboratories	Men
U. S. Steel Corporation	4	66
Other steel companies	27	164
Iron and steel foundries	16	55
Non-ferrous metals	74	583
Automobiles and parts	45	810
Other machinery	114	1,645
Total metal trades	**280 laboratories**	**3,323 men**
Electrical Equipment—	Laboratories	Men
Radio	14	79
Electrical equipment	53	3,568
Total electrical	**67 laboratories**	**3,647 men**
Chemical Products—	Laboratories	Men
Paints, varnishes	47	586
Dyes	32	502
Explosives	6	295
Fertilizers	8	68
Other chemicals	114	1,076
Total chemical products	**207 laboratories**	**2,527 men**
Organic Materials—	Laboratories	Men
Food	99	431
Drugs	48	226
Textiles	24	218
Rubber	24	1,066
Paper and forest products	52	401
Total organic materials	**247 laboratories**	**2,342 men**
Fuels—	Laboratories	Men
Oils and lubricants	43	790
Solid and gaseous fuels	27	277
Total on fuel	**70 laboratories**	**1,067 men**
Miscellaneous—	Laboratories	Men
Photographic and optical	24	313
Cement	17	141
Refractories	12	66
Unclassified	76	919
Total miscellaneous	**129 laboratories**	**1,439 men**

An item worthy of remark is the small number of companies making radio equipment which are conducting research. Perhaps this industry relies upon the work of the larger electrical companies and the discoveries of the unattached scientist, inventor or amateur. On the other hand, note the very large laboratories engaged in the study of explosives and rubber goods. Figures under "food" represent the wide interest in scientific preparation and marketing of milk, beverages, cereals, and meats.

In its broad aspects, the general picture of industrial research in America is nothing to be ashamed of. Naturally the chemical industry leads by a wide margin. Yet certain industries are very backward—notably in the field of construction materials. Iron and steel production is not much better; it is redeemed only by the surprising figures in the automotive and general machinery fields. Evidently metallurgical advances, except perhaps in non-ferrous metals, come more from demands arising in the consuming interests than from developments originating with producers.

Iron and Steel Markets

September Prospects Brighter

August Pig Iron Output Barely ½ Per Cent Under July—
Gradual Improvement in Steel Looked For—
Prices Generally Steady

DEMAND as represented by specifications and new orders has been sufficient to increase slightly the operations of the Steel Corporation in the last days of August, but it will not be surprising if steel production of the month for the industry as a whole will prove to be no larger than July, when a shade over 70 per cent of capacity was engaged.

Betterment is looked for through September. This promises to be very gradual, at least in the first half, with all industries, rather than a few particular ones, contributing. Construction enterprises continue to give a good account of themselves, some rail negotiations are in their first stages, but any marked expansion in automobile steel demand is postponed into October.

There are practically no developments in prices. The situation is still one of mills standing firm in the face of purchases no larger sometimes than commonly satisfied by warehouses. Here and there production is curtailed below the rate of current demand to accumulate orders for an approach to economical rolling.

August production of pig iron, from preliminary estimates, was slightly under July. Pending complete returns, it may be put at 2,936,000 tons, which is roughly 15,000 tons, or ½ per cent, below July. The loss in daily output compared with the preceding month is not 485 tons, whereas the drop from July to August last year was 737 tons per day. From the high point in April, however, the daily production rate shows a recession of 17 per cent this year against 10 per cent last year. The eight months' output stands at about 25,318,000 tons, or midway between the corresponding totals of 1925 and 1926.

The showing also is that 187 furnaces will be active Sept. 1, or three less than a month ago. There was a net loss of one steel-making and two merchant stacks.

Structural steel bookings for the week covered close to 50,000 tons, including 12,000 tons for a Detroit department store, 9300 tons for a railroad station in Buffalo, 7000 tons for a hotel in Chicago and 2700 tons for a building in Los Angeles. Added to projects pending was about 47,000 tons, of which 12,000 tons is for a subway repair shop in New York and 16,000 tons for other New York subway construction work.

Orders for oil tanks and fabricated plate work in July amounted to somewhat more than those of June, and the Department of Commerce figures show that the seven months business covered 301,000 tons, or more than for the same period in three years.

Rail orders for immediate shipment are reported from Chicago in six lots calling for 6000 tons. Inquiries for the regular fall buying movement have not appeared, but it is learned that the Louisville & Nashville is planning for 60,000 tons. Some quickening in light rails is attributed to the improvement in the coal market.

In pig iron there are indications of greater firmness, although sharply competitive prices are still reported in some markets. In the Chicago district the week saw the arrival of the first of several boatloads of Cleveland foundry iron, which has been sold at $19, delivered, as against a base price of $19.50 at Chicago furnaces. Alabama foundry iron has been quoted in the southeastern Atlantic States at $16.75, Birmingham, a reduction of 50c. a ton. On the other hand, prices of foundry iron in the Valleys, in southern Ohio, at Birmingham and in the East withstood the test of a 15,000-ton purchase by a large sanitary company, covering fourth quarter requirements.

There are evidences that Eastern furnaces have built up fair backlogs and are less anxious to obligate themselves further at recent low prices. Cleveland producers booked 175,000 tons in August, or 20 per cent less than the July total, which, however, exceeded that of any previous month of the year.

Furnace coke released for spot shipment by the banking of two Valley blast furnaces has checked a tendency toward stronger prices caused by heavier demands for heating and domestic coke.

Makers of track bolts have put large sizes on a list and discount basis, quoting 70 per cent off for large lots and 60 off for smaller lots. Small track bolts have been quoted at a discount from list since April 1.

Some price irregularity is noted in blue annealed sheets where for a limited range of widths strip steel quotations have been named, or $2 below the ruling prices for the product as sheets.

Finished steel exports from the United States in July were 149,220 tons, compared with 162,544 tons in July last year. There was a loss of more than 7000 tons in rail exports. Double as much scrap was exported, 17,499 tons against 8910 in July, 1926.

Imports of pig iron in July were 10,377 tons, or less than one-third the 32,206 tons a year ago. Finished steel imports advanced 11 per cent, due in part to increases of 2000 tons in beams, 4100 tons in hoops and 2400 tons in wrought pipe.

There are British proposals to grant rebates to merchants and consumers who buy only British steel. The reduction in Cleveland pig irons has not developed the hoped-for export business.

The Dominion Iron & Steel Corporation has sold 8000 tons of rails to India.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	Aug.30, 1927	Aug.23, 1927	Aug.2, 1927	Aug.31, 1926
No. 2, fdy., Philadelphia	$20.76	$20.76	$20.76	$21.76
No. 2, Valley furnace	17.50	17.50	18.00	17.50
No. 2, Southern, Cin'ti	20.94	20.94	20.94	24.19
No. 2, Birmingham	17.25	17.25	17.25	21.00
No. 2 foundry, Chicago*	19.50	19.50	19.50	21.00
Basic, del'd eastern Pa	20.00	20.00	20.75	20.75
Basic, Valley furnace	17.25	17.25	17.50	17.50
Valley Bessemer, del'd P'gh	*19.96*	20.26	20.26	19.76
Malleable, Chicago*	19.50	19.50	19.50	21.00
Malleable, Valley	17.50	17.50	18.00	17.50
Gray forge, Pittsburgh	18.76	18.76	19.26	18.76
L. S. charcoal, Chicago	27.04	27.04	27.04	29.04
Ferromanganese, furnace	90.00	90.00	90.00	88.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	34.00
Bess. billets, Pittsburgh	33.00	33.00	33.00	35.00
O.-h. billets, Pittsburgh	33.00	33.00	33.00	35.00
O.-h. sheet bars, P'gh	34.00	34.00	34.00	36.00
Forging billets, P'gh	39.00	39.00	39.00	40.00
O.-h. billets, Phila	38.30	38.30	38.30	40.30
Wire rods, Pittsburgh	43.00	43.00	43.00	45.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.80	1.80	1.80	1.90
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.12	2.12	2.12	2.22
Iron bars, Chicago	2.00	2.00	2.00	2.00
Steel bars, Pittsburgh	1.80	1.80	1.80	2.00
Steel bars, Chicago	*1.90*	2.00	2.00	2.10
Steel bars, New York	2.14	2.14	2.14	2.34
Tank plates, Pittsburgh	1.80	1.80	1.80	1.90
Tank plates, Chicago	1.90	1.90	2.00	2.10
Tank plates, New York	2.09	2.09	2.09	2.24
Beams, Pittsburgh	1.80	1.80	1.80	2.00
Beams, Chicago	1.90	1.90	2.00	2.10
Beams, New York	1.95	1.95	2.04	2.34
Steel hoops, Pittsburgh	2.30	2.30	2.30	2.50

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire,	Aug.30, 1927	Aug.23, 1927	Aug.2, 1927	Aug.31, 1926
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	3.00	3.00	3.00	2.95
Sheets, black, No. 24, Chicago dist. mill	3.10	3.10	3.10	3.10
Sheets, galv., No. 24, P'gh	3.85	3.85	3.85	3.80
Sheets, galv., No. 24, Chicago dist. mill	3.95	3.95	3.95	3.95
Sheets, blue, 9 & 10, P'gh	2.25	2.25	2.25	2.30
Sheets, blue, 9 & 10, Chicago dist. mill	2.35	2.35	2.35	2.40
Wire nails, Pittsburgh	2.55	2.55	2.55	2.65
Wire nails, Chicago dist. mill	2.60	2.60	2.60	2.70
Plain wire, Pittsburgh	2.40	2.40	2.40	2.50
Plain wire, Chicago dist. mill	2.45	2.45	2.45	2.55
Barbed wire, galv., P'gh	3.25	3.25	3.25	3.35
Barbed wire, galv., Chicago dist. mill	3.30	3.30	3.30	3.40
Tin plate, 100 lb. box, P'gh	$5.50	$5.50	$5.50	$5.50
Old Material, Per Gross Ton:				
Carwheels, Chicago	$14.50	$14.50	$14.50	$15.50
Carwheels, Philadelphia	15.50	15.50	15.00	17.50
Heavy melting steel, P'gh	15.50	15.50	15.25	18.00
Heavy melting steel, Phila.	14.00	14.00	13.00	17.00
Heavy melting steel, Ch'go	12.00	12.00	12.50	14.00
No. 1 cast, Pittsburgh	15.00	15.00	15.00	17.00
No. 1 cast, Philadelphia	16.00	16.00	16.00	18.50
No. 1 cast, Ch'go (net ton)	14.75	14.75	15.00	17.00
No. 1 RR. wrot, Phila	15.50	15.50	15.50	18.50
No. 1 RR. wrot, Ch'go (net)	11.50	11.50	12.00	13.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$3.00	$3.00	$3.00	$3.15
Foundry coke, prompt	4.00	4.00	4.00	4.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	13.25	13.25	13.37½	14.50
Electrolytic copper, refinery	**13.00**	12.87½	13.00	14.12½
Zinc, St. Louis	*6.25*	6.32½	6.40	7.42½
Zinc, New York	*6.60*	6.67½	6.75	7.77½
Lead, St. Louis	6.30	6.30	6.45	8.65
Lead, New York	*6.60*	6.65	6.60	8.90
Tin (Straits), New York	*63.50*	63.75	65.50	65.87½
Antimony (Asiatic), N. Y.	**12.00**	11.62½	12.25	16.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Foundry Pig Iron Market Stands Test of Large Sale—Steel Trade Dull

PITTSBURGH, Aug. 30.—Evidence of improvement in the demand for finished steel is still lacking. While the leading steel-making subsidiary of the Steel Corporation in the past week had the largest orders since the early part of August, such a report finds no duplication either among other corporation companies or the independent manufacturers. In all products and with most companies, incoming orders and specifications are fairly numerous, but cover very small tonnages. In the Youngstown district it has been necessary for sheet makers to resort to curtailed mill operations to let enough business accumulate to provide economical scheduling. In this and all other finished products, buyers continue to take full advantage of the fact that there is considerable mill capacity and that there is little danger that they will be unable in the near future to place orders one day and begin to get delivery within the next 48 hr. And because their order books are slim, manufacturers have no other course but to accommodate themselves to that kind of buying.

Ingot production is hardly maintaining even its recent low rate; it is somewhat above 65 per cent of "practical" capacity, but not greatly in excess of 60 per cent of what is called theoretical capacity. Pig iron production has been falling rather steadily in the past month, and in this and nearby districts only half of the 125 furnaces are in production. Only three merchant furnaces in the Valleys are making iron, two having been banked in the past few days. Of the 107 steel works furnaces, 58 are producing.

It is possible that the decline in production may explain the inability of a large user of foundry iron to develop a lower price than $17.50, Valley furnace, for No. 2 grade on a purchase of fairly large tonnage. The market, however, has declined 50c. a ton on Bessemer iron, a sale by western Pennsylvania steel company at $18, furnace, or $19.96, delivered Pittsburgh district, having forced a revision by Valley makers.

Developments in the scrap market plainly indicate that the recent price flurry was entirely due to a covering of short sales by dealers, and, in the absence of any support through consumer purchases, the market now tends to grow easier. Banking of two Valley furnaces has released some furnace coke for spot shipment, and these offerings have served to check an advance in prices that was beginning to get under way as a result of the growing demand for coke for heating and household purposes and the fact that production of metallurgical coke was running very nearly even with contract requirements. Domestic sizes of coal are moving well, and Panhandle coal is selling from $3 to $3.50 per net ton at mines. Industrial demands, however, are still light, and prices of industrial coal, though firm, are no higher than they have been.

Pig Iron.—The Standard Sanitary Mfg. Co. has closed for a part of the fourth quarter requirements of its several plants. Purchases are placed at approximately 15,000 tons, about 4000 tons having been bought for its Baltimore plant and the remainder divided between its local and Louisville, Ky., works. Eastern iron was bought at $20, furnace, for No. 2 grade, while southern Ohio iron bought for Louisville was generally

at $21.50, delivered, and some bought in the Birmingham district for that plant carried a price of $17.25, furnace, for No. 2. Valley iron commanded $17.50 for the base grade. These prices are generally what have been prevailing in the several markets for the past few weeks. The National Radiator Corporation recently closed for 1000 tons of foundry iron for its New Castle, Pa., works at $17.50, and the same price was paid by the Elliott Co., Jeannette, Pa., for approximately 1700 tons. Altogether, it has been the heaviest week in some time in foundry iron sales, but not much activity has marked the steel-making grades. A recent sale of 2000 tons of Bessemer iron at $18 by a western Pennsylvania steel company having the same rate of freight to Pittsburgh district destinations as the Valley furnaces, has resulted in Valley producers going to that price on sizable lots, although they still are getting 25c. to 50c. a ton more for small tonnages. Basic iron is nominal at $17.50, Valley furnaces.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$17.25 to $17.50
Bessemer	18.00 to 18.50
Gray forge	17.00 to 17.50
No. 2 foundry	17.50 to 18.00
No. 3 foundry	17.00 to 17.50
Malleable	17.50 to 18.00
Low phosphorus, copper free	27.50 to 28.00

Freight rate to the Pittsburgh or Cleveland district, $1.76.

Ferroalloys.—Spot sales of ferromanganese, spiegeleisen and high grade ferrosilicon are almost nil, and the dullness of the market is intensified by the fact that contract buyers are specifying very sparingly in keeping with the comparatively low rate of consumption and the fact that there is a common tendency to reduce stocks. Prices are unchanged.

Semi-Finished Steel.—Sheet, tin plate and strip manufacturers who do not make their own steel appear to have sufficient stocks of billets, slabs and sheet bars to take care of much of the business that they now are doing in the finished products, and the demand for semi-finished steel is not only of a supplementary character, but is in very small volume. Prices are holding chiefly because producers are matching smaller demands with curtailed output. Activity also is lacking in forging quality steel, since the automotive industry is not yet moving toward quantity production, and in skelp and wire rods, the finished products of which are not selling with much freedom.

Wire Products.—Business is far from active, but this condition is regarded as natural, since this period is rarely one of big consumption and mill orders reflect the rate of consumption more closely than they did when buying was at longer range. Prices are steady but are not being seriously tested, since demand is light and consumers and jobbers generally are covered for this quarter of the year at more favorable prices than now prevail. Mill operations are liberally estimated at 50 per cent of capacity.

Rails and Track Supplies.—Slight betterment in the coal market has caused some quickening in the demand for light-section rails, but business is still slack in standard-section rails and in track accessories. Prices are steady but untested on spikes and tie plates.

All makers of track bolts are now quoting all sizes on a list and discount basis, list prices having been revised to include the diameters 13/16 in. and larger, which have been selling on a pound basis. All sizes are now being sold on a per hundred piece basis, subject to a discount of 70 per cent for large lots and 60 per cent for smaller lots.

Tubular Goods.—Buttwelded pipe is moving steadily enough, but business lacks volume and most makers find their shipments for the year to date well behind the same period last year. Lapwelded pipe is dull, although there is a scattering demand for shallow well drilling pipe and small line pipe orders are fairly constant. Seamless pipe suffers from the fact that deep well drilling has been almost completely stopped by the low prices of oil; fairly high oil prices are necessary for the profitable development of deep wells. Pipe mill engagement ranges from 60 to 65 per cent of capacity, but most mills are putting some of the production into stock. Tube business could be better.

Sheets.—The market still pursues its uneventful way, with orders fairly numerous but in almost all cases for small tonnages for prompt shipment. There is no evidence yet of any substantial expansion of requirements among the important consuming industries. The automobile builders and body and parts makers are taking hold cautiously, and steel manufacturers supplying them are coming to the conclusion that the industry is being held in check until the plans of the Ford Motor Co. are definitely known. Some believe the new Ford car will be on the market during the next 30 days, but a good many more do not expect it to appear until much later in the year. Sheet prices are steady but not rigid. Mill operations continue at about 70 per cent of capacity.

Tin Plate.—The remainder of this year presents such a poor prospect for tin plate that the attention of manufacturers is directed toward next year. That there will be a short pack of tomatoes, peas, corn and peaches is now generally admitted. But it is expected that this development will mean a cleaning up of surplus 1926 stock and of this year's pack, with an advance in prices that will sufficiently stimulate packing next year so that the loss in tin plate production this year will be more than made up. Standard coke tin plate is still based at $5.50 per base box, Pittsburgh, subject to preferential concessions. Few buyers are paying the full base quotations, since all producers need orders and stock tin plate is being offered freely and at materially lower prices than were asked and obtained earlier in the year.

Cold-Finished Steel Bars and Shafting.—Since the automotive industry, the most important outlet for cold-finished steel bars, is generally marking time awaiting the appearance of the new Ford car, makers are finding orders few and small. There is so much competition that 2.30c., base Pittsburgh, is hard to obtain even for the size of order that usually commands a premium. Some makers are waiving the extra

The Iron Age Composite Prices

Finished Steel

Aug. 30, 1927, 2.367c. a Lb.

One week ago	2.367c.
One month ago	2.367c.
One year ago	2.431c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 86 per cent of the United States output of finished steel.

	High		Low	
1927	2.453c.,	Jan. 4;	2.339c.,	April 26
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	April 24;	2.446c.,	Jan. 2

Pig Iron

Aug. 30, 1927, $18.13 a Gross Ton

One week ago	$18.13
One month ago	18.34
One year ago	19.46
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1927	$19.71,	Jan. 4;	$18.13,	Aug. 9
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	March 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills	1.80c.
F.o.b. Chicago	1.90c. to 2.00c.
Del'd Philadelphia	2.12c.
Del'd New York	2.14c.
Del'd Cleveland	1.99c.
F.o.b. Cleveland	1.80c.
F.o.b. Birmingham	1.95c. to 2.05c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills	1.80c. to 1.90c.
F.o.b. Birmingham	1.95c. to 2.05c.

Rail Steel

F.o.b. mill	1.65c. to 1.80c.
F.o.b. Chicago	1.90c.

Iron

Common iron, f.o.b. Chicago	2.00c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.12c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mills	1.75c. to 1.80c.
F.o.b. Chicago	1.90c. to 2.00c.
F.o.b. Birmingham	1.90c. to 2.00c.
Del'd Cleveland	1.99c.
Del'd Philadelphia	2.07c. to 2.12c.
Del'd New York	2.09c. to 2.14c.
C.i.f. Pacific ports	2.30c. to 2.40c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills	1.75c. to 1.80c.
F.o.b. Chicago	1.90c. to 2.00c.
F.o.b. Birmingham	1.90c. to 2.00c.
Del'd Cleveland	1.99c.
Del'd Philadelphia	1.90c. to 2.02c.
Del'd New York	1.90c. to 2.04c.
C.i.f. Pacific ports	2.35c. to 2.40c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh	2.30c.
All gages, 6 in. to 12 in., P'gh	*2.10c.
Nos. 13 and 14 gage, 12 in. to 14 in., P'gh, net	2.30c.
Nos. 15 and 16 gage, 12 in. to 14 in., P'gh, net	2.40c.
All gages, narrower than 6 in., Chicago,	2.40c. to 2.60c.
All gages, 6 in. and wider, Chicago,	2.20c. to 2.50c.
Cotton ties, per bundle 45-lb. out of stock, f.o.b. Atlantic ports	$1.21
Cotton ties, per bundle 45-lb. out of stock, f.o.b. Gulf ports	$1.20

*Mills follow plate or sheet prices according to gage on wider than 14 in.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	2.20c. to 2.30c.
Bars, f.o.b. Chicago	2.30c.
Bars, Cleveland	2.30c. to 2.35c.
Shafting, ground, f.o.b. mill	*2.45c. to 2.90c.
Strips, under 12 in., f.o.b. P'gh mill	3.25c.
Strips, under 12 in., f.o.b. Cleveland mills	3.25c.
Strips, under 12 in., delivered Chicago	3.55c.
Strips, under 12 in., f.o.b. Worcester mill	3.40c.
Stripsheets, 12 in. and wider, Pittsburgh mill	3.00c.
Stripsheets, 12 in. and wider, Cleveland mill	3.00c.
Stripsheets, 12 in. and wider, del'd Chicago	3.30c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	$2.55
Galvanized nails	4.55
Galvanized staples	3.25
Polished staples	3.00
Cement coated nails	2.55

	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.40
Annealed fence wire	2.55
Spring wire	3.40
Galv'd wire, No. 9	3.00
Barbed wire, galv'd	3.25
Barbed wire, painted	3.00

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh	2.25c.
Nos. 9 and 10, f.o.b. Chicago dist. mill	2.35c.
Nos. 9 and 10, del'd Philadelphia	2.57c.
Nos. 9 and 10, f.o.b. Birmingham	2.40c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	3.00c.
No. 24, f.o.b. Ch'go dist. mill	3.10c.
No. 24, del'd Philadelphia	3.32c.
No. 24, f.o.b. Birmingham	3.15c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade	4.15c.
No. 24, f.o.b. Pittsburgh, B grade	3.95c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.85c.
No. 24, f.o.b. Chicago dist. mill	3.95c.
No. 24, del'd Philadelphia	4.17c.
No. 24, f.o.b. Birmingham	4.00c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	3.00c. to 3.10c.
No. 28, f.o.b. Chicago dist. mill	3.20c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	4.25c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill	4.20c. to 4.30c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind.	5.60

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)

(Per package, 20 x 28 in.)

8-lb. coating I.C.	$11.40
15-lb. coating I.C.	14.45
20-lb. coating I.C.	15.80
25-lb. coating I.C.	$17.30
30-lb. coating I.C.	18.75
40-lb. coating I.C.	20.85

Alloy Steel Bars

(F.o.b. Pittsburgh, Chicago or Ohio Mill)

S. A. E. Series Numbers		Base Per 100 Lb.
2100*	(1½% Nickel, 0.10% to 0.20% Carbon)	$2.90 to $3.00
2300	(3½% Nickel)	4.10 to 4.20
2500	(5% Nickel)	5.00 to 5.25
3100	(Nickel Chromium)	3.10 to 3.20
3200	(Nickel Chromium)	4.75 to 5.00
3300	(Nickel Chromium)	6.75 to 7.00
3400	(Nickel Chromium)	6.00 to 6.25
5100	(Chromium Steel)	3.10 to 3.20
5200*	(Chromium Steel)	7.00 to 7.50
6100	(Chrom. Vanadium bars)	4.10 to 4.30
6100	(Chrom. Vanad. spring steel)	3.60 to 3.80
9250	(Silicon Manganese spring steel)	3.00 to 3.15
	Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.)	4.10 to 4.20
	Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.)	4.10 to 4.30
	Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.)	4.00 to 4.25
	Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.)	3.10 to 3.20
	Chromium Molybdenum spring steel (1—1.25 Chrom., 0.30—0.50 Molybdenum)	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specification, but numbered by manufacturers to conform to S. A. E. system.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	$36.00 to 38.00

Track Equipment

(F.o.b. Mill)

	Base Per 100 Lb.
Spikes, ⅝ in. and larger	$2.80 to $2.90
Spikes, ½ in. and smaller	2.80 to 3.00
Spikes, boat and barge	3.10
Tie plates, steel	2.35
Angle bars	2.75
Track bolts, all sizes, per 100 count,	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	⅛ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	13
1 to 3	62	50½			

Lap Weld

2	55	48½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	⅛ to ⅜	+10	+54
¼ to ⅜	47	30½	½	21	17
½	53	42½	¾	26	12
¾	58	47½	1 to 1½	30	14
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	15
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.	27	1½ in.	+18
2½ to 2¾ in.	37	1¾ to 1⅞ in.	+ 8
3 in.	40	2 to 2¼ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Beyond the above discounts, 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	60	3 in.	45
1¼ to 1½ in.	52	3¼ to 3½ in.	47
1¾ in.	36	4 in.	50
2 to 2¼ in.	31	4½, 5 and 6 in.	45
2½ to 2¾ in.	39		

Hot Rolled

2 and 2¼ in.	37	3¼ and 3½ in.	53
2½ and 2¾ in.	45	4 in.	56
3 in.	51	4½, 5 and 6 in.	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.

for lots of less than 24,000 lb. The prevailing price is 2.20c., base Pittsburgh.

Hot-Rolled Flats.—Demand for hoops, bands and strips is fairly constant, but of such small volume that few makers can work out a satisfactory mill schedule or look ahead on order books for more than a week. Prices are firmly maintained, but the test of a sizable demand is lacking.

Cold-Rolled Strips.—Consumers are steadily reducing stocks, built up late in June, by liberal specifications against second quarter contracts, and their fresh requirements are running somewhat heavier, with the result that mill operations, which recently were under 65 per cent of capacity, have increased by about 5 points. There is firm adherence to quoted prices, but it is admitted that the motor car builders have not yet provided a real test in the shape of big orders.

Bolts, Nuts and Rivets.—August has been an improvement on July in specifications, but has not been an active period for makers in this district. Prices are firm, however, as there is no tendency by makers to try to stimulate purchases at the expense of profits. Large rivets are still quotable from $2.75 to $3, base, per 100 lb., Pittsburgh or Cleveland. The higher figure established by makers, as of July 15, does not appear to have had much basis in sales, since an earlier announcement of that price as applying to non-contracting buyers had the effect of making many of them cover for this entire quarter. Spot business is still being accepted by some makers at $2.75, base, and it is a forecast from reliable sources that fourth quarter contracts will be written at that figure. Small rivets are quotable here at 70, 10 and 5 per cent off list, but lower prices are appearing in other markets.

Steel and Iron Bars.—Steel bars are dull, although some makers have noted a slight pick-up in specifications in the past few days. The lack of large buying by important consumers, however, is not made good by the orders of smaller consumers and distributers. The market is holding at 1.80c., base Pittsburgh, producers not being inclined to make a lower price to large consumers, since just now they are providing few orders of size. Changes in mill schedules are frequent in meeting the delivery requirements of buyers. There is much idle capacity. Iron bars are slow, but prices are steady.

Plates.—Barge orders are providing some tonnage for local mills, but plate fabricators generally are running at a low rate and are not buying very heavily. The mills need orders, but it takes a fair-sized tonnage to bring out a lower price than 1.80c., base Pittsburgh.

Structural Shapes.—Mills in this area have a fair amount of old business, but new bookings reflect the decline in fabricated steel lettings. Fabricating companies are figuring on a good deal of business but are not getting many worthwhile jobs. Interest locally centers in the Grant Building, a 30-story structure for the heart of the city; a definite inquiry for the steel is yet to appear, but it is estimated that between 5000 and 10,000 tons of steel will be needed. Small lots of plain material continue to sell for nearby shipment at 1.80c., but on the larger tonnages prices are competitive, as they are said to be on construction projects.

Coke and Coal.—The coal market still exhibits a firm tone, but it is more apparent in the prepared sizes for household use than in coal for industrial use, demand for which is still light while buyers use up their stocks. Some fear that as the winter approaches there will be a demand that will necessitate a resumption of operations at closed union mines and at the union rate of wages, but there are just as many who believe that non-union production can be expanded to meet the country's average winter requirements and that there is no danger of a shortage or of materially higher prices than now prevail. The spot furnace coke market is temporarily depressed by some tonnage released through blast furnace suspensions, but good furnace coke is not available below $3 per net ton at ovens, offerings at less usually being too high in sulphur to find use by pig iron producers. Sales as high as $3.25 are still noted. Spot foundry coke still ranges from $4 to $4.50 for good brands, and about $1 higher is asked for fuel produced from washed and selected coal.

Old Material.—There has been no special change in this market, which on the basis of supplies alone is firm. It needs a strong consumptive demand, however, to move it to the higher levels, which dealers believe are warranted by the size of the offerings. It takes two to make a market, and just now there are sellers, but no buyers. Recent prices continue to hold except for slight reductions in heavy breakable cast and in short shoveling steel turnings. The September scrap list of the Baltimore & Ohio Railroad contains 22,150 gross tons, including 5000 tons of heavy melting steel and 3500 tons each of long rails and cast iron wheels.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Furnace Grades:	
Heavy melting steel	$15.25 to $15.75
Scrap rails	14.50 to 15.00
Compressed sheet steel	14.50 to 15.00
Bundled sheets, sides and ends	13.50 to 14.00
Cast iron carwheels	15.00 to 15.50
Sheet bar crops, ordinary	15.50 to 16.00
Heavy breakable cast	14.50 to 15.00
No. 2 railroad wrought	15.25 to 15.75
Heavy steel axle turnings	14.00 to 14.50
Machine shop turnings	11.50 to 12.00
Acid Open-Hearth Furnace Grades:	
Railroad knuckles and couplers	16.75 to 17.25
Railroad coil and leaf springs	16.75 to 17.25
Rolled steel wheels	16.75 to 17.25
Low phosphorus billet and bloom ends	20.00 to 20.50
Low phosphorus, mill plate	19.50 to 20.00
Low phosphorus, light grade	17.00 to 17.50
Low phosphorus sheet bar crops	19.00 to 19.50
Heavy steel axle turnings	14.00 to 14.50
Electric Furnace Grades:	
Low phosphorus punchings	17.00 to 17.50
Heavy steel axle turnings	14.00 to 14.50
Blast Furnace Grades:	
Short shoveling steel turnings	11.50 to 12.00
Short mixed borings and turnings	11.00 to 11.50
Cast iron borings	11.00 to 11.50
No. 2 busheling	10.25 to 10.75
Rolling Mill Grades:	
Steel car axles	19.00 to 20.00
No. 1 railroad wrought	12.00 to 12.50
Cupola Grades:	
No. 1 cast	15.00 to 15.50
Rails 3 ft. and under	16.00 to 16.50
Malleable Grades:	
Railroad	15.25 to 15.75
Industrial	14.75 to 15.25
Agricultural	14.25 to 14.75

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c. to 3.65c.
Hoops	4.00c. to 4.50c.
Black sheets (No. 24 gage), 25 or more bundles	3.75c.
Galvanized sheets (No. 24 gage), 25 or more bundles	4.60c.
Blue annealed sheets (No. 10 gage), 25 or more sheets	3.30c.
Spikes, large	3.30c. to 3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, ¾ in. and smaller, per 100 count,	62½ per cent off list
Machine bolts, per 100 count.	62½ per cent off list
Carriage bolts, per 100 count.	62½ per cent off list
Nuts, all styles, per 100 count,	62½ per cent off list
Large rivets, base per 100 lb	$3.50
Wire, black soft annealed, base per 100 lb	2.90
Wire, galvanized soft, base per 100 lb	2.90
Common wire nails, per keg	$2.80 to 2.90
Cement coated nails, per keg	2.85 to 2.95

Losses of eyes through industrial accidents in Pennsylvania have been reduced through safety efforts. The metals and metal products industry still leads, however, with 169 eyes lost in 1926, compared with 182 in 1925 and 200 in 1924. The totals for all industries are given as 575 in 1926, 538 in 1925 and 658 in 1924. The figures are from the Department of Labor and Industry of Pennsylvania.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over	$33.00
Rerolling, under 4-in. to and including 1¾-in.	$33.50 to 34.00
Forging, ordinary	39.00 to 40.00
Forging, guaranteed	44.00 to 45.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$34.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$33.00
Smaller than 8 in. x 2 in.	34.00

Skelp

	Per Lb.
Grooved	1.80c.
Sheared	1.80c.
Universal	1.80c.

Wire Rods

	Per Gross Ton
*Common soft, base	$43.00
Screw stock	$5.00 per ton over base
Carbon 0.20% to 0.40%	3.00 per ton over base
Carbon 0.41% to 0.55%	5.00 per ton over base
Carbon 0.56% to 0.75%	7.50 per ton over base
Carbon over 0.75%	10.00 per ton over base
Acid	15.00 per ton over base

*Chicago mill base is $44. Cleveland mill base, $43.

Prices of Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	10.50c.
Iron ore, Swedish, average 66% iron,	9.75c. to 10.00c.
Manganese ore, washed, 52% manganese, from the Caucasus	40c. to 41c.
Manganese ore, Brazilian, African or Indian, basis 50%	40c. to 42c.
Tungsten ore, high grade, per unit, in 60% concentrates	$10.50 to $10.75

	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00

	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$3.00 to $3.25
Foundry, f.o.b. Connellsville prompt	4.00 to 4.50
Foundry, by-product, Ch'go ovens	9.75
Foundry, by-product, New England, del'd	12.00
Foundry, by-product, Newark or Jersey City, delivered	9.59 to 10.77
Foundry, Birmingham	5.50
Foundry, by-product, St. Louis	9.75

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.50 to $1.90
Mine run coking coal, f.o.b. W. Pa. mines	1.60 to 1.90
Mine run gas coal, f.o.b. Pa. mines	2.00 to 2.15
Steam slack, f.o.b. W. Pa. mines	1.25 to 1.35
Gas slack, f.o.b. W. Pa. mines	1.40 to 1.60

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$90.00
Foreign, 80%, Atlantic or Gulf port, duty paid	90.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$33.00 to $34.00
Domestic, 16 to 19%	32.00 to 33.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$85.00 to $87.50
75%	145.00

	Per Gross Ton Furnace		*Per Gross Ton Furnace*
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	$45 to 46.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		*Per Gross Ton*
10%	$34.00	12%	$38.00
11%	36.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		*Per Gross Ton*
6%	$26.50	10%	$32.00
7%	27.50	11%	34.00
8%	28.50	12%	36.00
9%	30.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd	95c. to $1.05
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.50c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton	$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$17.00
No. 2 lump, Illinois and Kentucky mines	$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$16.00
Domestic. No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

	Per 1000 f.o.b. Works First Quality	Second Quality
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	——
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagon	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled threads up to and including ⅝ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages	80, 10 and 5
Stove bolts in bulk	80, 10, 5 and 2½
Tire bolts	60 and 5

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.75 to $3.00
F.o.b. Chicago	2.85 to 3.10

Small Rivets

(½-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5 to 70 and 10
F.o.b. Chicago	70, 10, 10 and 5 to 70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 10
Milled standard set screws, case hardened,	80 and 10
Milled headless set screws, cut thread	80
Upset hex. head cap screws, U.S.S. thread,	85 and 5
Upset hex. cap screws, S.A.E. thread	85 and 5
Upset set screws	80, 10 and 10
Milled studs	70 and 5

Chicago

Cargo of Iron Arrives from Cleveland—August Steel Bookings Disappointing

CHICAGO, Aug. 30.—August proved a disappointment to the steel trade, not alone from the standpoint of new business and specifications but also because the closing days of the month failed to give any definite sign pointing to higher operations in the early fall. Steel works blast furnace operations are lower by one furnace than in July and ingot production is down in like proportion, averaging about 65 per cent of capacity as the month comes to a close.

Sagging prices have added to the stress of the situation, and, in addition, rolling schedules have become so disarranged that many small buyers, requiring quick service, have turned to warehouses for their meager requirements. Scattered orders for a few cars each are all that the month can boast of in the way of railroad equipment business. Fabricators, seeing only a moderate amount of tonnage coming into the market, are more determined than ever to take orders and their prices have dropped at least $2 a ton in the last week or 10 days. On the brighter side of the market are well sustained orders for some classes of wire products, sheets, hot and cold-rolled strips, and a good late summer demand for reinforcing bars.

In the main, books for the fourth quarter will not be opened until after Labor Day. Sales of finished steel show some improvement but are still well below shipments, indicating a further decline in mill backlogs.

Pig Iron.—The cargo boat Henry Cort has been docked at Chicago with iron from Cleveland. This is the first of a number of water shipments against sales of 3500 tons in Chicago and 7000 tons in Milwaukee. Orders for this iron were taken at $19, delivered. Chicago producers of pig iron are holding their prices at $19.50, base furnace. Both sales and inquiries for Northern iron are more numerous. Sales in August exceeded shipments by a small margin, and shipments were the best in three months. Stocks in the hands of users are probably better balanced than a month ago. The trade believes that current shipments now closely approximate the actual melt of iron. Business among jobbing foundries is spotty, but manufacturers who operate foundries are working steadily, though at a lower rate than early in the summer. Fresh inquiries for foundry iron include 1000 tons for a user north of Chicago and 500 tons for an Indiana melter. Shipments of merchant iron are approximately equal to production. Charcoal iron is moderately active in carload lots at $27.04, delivered Chicago. Silvery is quiet at unchanged prices.

Prices per gross ton at Chicago:

Northern No. 2 foundry, sil. 1.75 to 2.25	$19.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	20.00
Malleable, not over 2.25 sil.	19.50
High phosphorus	19.50
Lake Superior charcoal, averaging sil. 1.50	27.04
Southern No. 2 fdy. (all rail)	23.26
Southern No. 2 (barge and rail)	21.43
Low phos., sil. 1 to 2 per cent, copper free	$31.50 to 32.00
Silvery, sil. 8 per cent	33.29
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—In new sales this market is dull. Specifications for ferromanganese and ferrosilicon total fairly large over an extended period of time, but individually they are small and represent the immediate requirements of users. Spot cars of 19 to 21 per cent spiegeleisen are moving at $33, Hazzard, Pa.

Prices delivered Chicago: 80 per cent ferromanganese, $97.56; 50 per cent ferrosilicon, $85 to $87.50; spiegeleisen, 18 to 22 per cent, $40.76 to $41.76.

Plates.—Two oil producers in the Southwest have ordered a total of 10,000 tons of plates for tank construction. This business with that placed in the last five weeks has added not less than 35,000 tons to Chicago mill books. Fresh inquiry is light, though producers estimate that about 5000 tons is still to be placed. Small orders for plates are numerous, particularly from boiler makers and manufacturers of small tanks, whose business usually follows the trend of building operations. Plate mills in this district are operating at 55 to 60 per cent of capacity, and deliveries on all sizes of plates are prompt. Specifications from car builders are light, the bulk of materials needed on recent large orders for cars already having been ordered out.

Mill prices on plates per lb.: 1.90c. to 2c., base, Chicago.

Structural Material.—Structural awards in Chicago total 9000 tons, the largest single letting being 6000 tons for the Bryn Mawr Beach Hotel. Competition among fabricators is unusually keen, and their prices appear to have reached a new low level for the year. Architects are redesigning the Medinah Athletic Club, and both the *Daily News* Building and the warehouse for Marshall Field & Co. are being delayed pending an agreement as to air rights. Mill prices on plain material are weak at 1.90c. to 2c., Chicago.

Mill prices on plain material per lb.: 1.90c. to 2c., base Chicago.

Reinforcing Bars.—This market is active both in terms of sales and fresh inquiries. The reinforcing bars for the Milliners Building, Chicago, 500 tons, have been placed, and Manly Junior High School, Chicago, will require 560 tons. Other new public school projects will take not less than 600 tons of bars. Prices are not definitely established. On billet steel bars old quotations at 2c. are still out, and it is doubtful whether the new price schedule is holding on new business. Rail steel bars are commonly quoted at 1.90c. to 2c., Chicago. Shops on the whole are well engaged, and new work in prospect is keeping engineers and architects busy. Awards and new inquiries are shown on page 588.

Bars.—Schedules calling for soft steel bars now being prepared by manufacturers of farm implements indicate that September deliveries to those users will be heavier than in August. Road machinery builders are specifying at a steady rate, and their order books promise to support a steady rate of output until winter manufacturing gets under way on machinery that is to be delivered in the spring. Specifications from cold-drawn bar makers are larger, showing a recovery from the slump experienced by that industry in midsummer. Specifications for soft steel bars are equal to shipments, but new buying is light. Ruling quotations in this territory range from 1.90c. to 2c., Chicago, the higher price being more common in Chicago than in outlying sections. Cold-drawn bar manufacturers are ordering out larger quantities of alloy steel bars. The demand for this commodity is steady, and prices are unchanged. Specifications for iron bars are heavier, but new buying is light and mills are operating on a hand-to-mouth basis. Demand for hard steel bars from the bed trade is showing improvement, and farm implement manufacturers are taking larger quantities. Shipments of fence posts are fair for this time of the year, and producers expect the fall trade in this commodity to open up in two or three weeks. Both Chicago Heights rail steel bar mills are operating on a double turn basis.

Mill prices per lb.: Soft steel bars, 1.90c. to 2c., base, Chicago; common bar iron, 2c., base, Chicago; rail steel bars, 1.90c., base, Chicago.

Cast Iron Pipe.—Royal Oak, Mich., has closed with the National Cast Iron Pipe Co. for 200 tons of 6-in. and 170 tons of 8-in. Class B pipe at close to $29, Birmingham. Fresh inquiry in this district includes 300 tons of 6-in. and 100 tons of 8-in. Class B pipe for Kenosha, Wis. Prices are easier on small lots, and local quotations range from $28 to $29, Birmingham, or $36.20 to $37.20 for 6-in. and larger diameters. Small orders are fairly numerous, but the aggregate tonnage of that kind of business has fallen below the average for the first three weeks of August. Public utilities and private buyers are inactive, but orders are coming from contractors at a steady rate. Although the summer buying movement has not developed as had been expected by the trade, the upward swing in orders from

contractors and the relatively large total tonnage of small orders have tended to hold in check the shrinkage in foundry order books. There are still some sizes of pipe that cannot be had in less than three weeks, but on the whole deliveries are prompt. At the moment makers of pipe are more concerned about obtaining a better balance of orders than larger bookings in miscellaneous sizes. Keen competition for certain diameters is largely responsible for the present low level of prices.

Prices per net ton, delivered Chicago: Water pipe, 6-in. and over, $36.20 to $37.20; 4-in., $40.20 to $41.20; Class A and gas pipe, $4 extra.

Rails and Track Supplies.—Reports that the Chicago, Milwaukee & St. Paul will soon come into the market for 20,000 to 25,000 tons of standard-section rails appear to be without foundation. Although several railroads are indicating interest in 1928 requirements, action on the only definite inquiry of note, that of the Chesapeake & Ohio, has been deferred for at least two weeks. Six miscellaneous orders for rails booked by Chicago mills total 6000 tons. This tonnage is for immediate shipment and does not represent advance requirements. Rail mill operations average about 35 per cent of capacity. Orders for light rails are in small volume, but the total business in August was the best in several months. Fresh inquiry is light. Orders for odd lots of track supplies total 4000 tons for the week. Operations in plants making track accessories have declined steadily, now being at about the same rate as ingot production.

Prices f.o.b mill, per gross ton: Standard-section open-hearth and Bessemer rails, $43; light rails, rolled from billets, $36 to $38. *Per Lb.:* Standard railroad spikes, 2.90c.; track bolts with square nuts, 3.90c.; steel tie plates, 2.35c.; angle bars, 2.75c.

Sheets.—Prices are steady for the current run of orders. These, for the most part, are individually small, but in the aggregate suffice to sustain mill operations in this district at a 75 per cent rate. Local buyers, particularly manufacturers, are taking out sheets at a steady rate, but orders from Southern jobbers are lighter. Price policies for the fourth quarter have not been announced.

Base prices per lb., delivered from mill in Chicago: No. 24 black, 3.15c.; No. 24 galvanized, 4c.; No. 10 blue annealed, 2.40c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Wire Products.—Shipments to the Missouri Valley and the South are growing. In and around Chicago the jobbing trade is slow, and there are no indications as to when a fall buying movement may get under way. It is generally believed that stocks in the hands of jobbers are low, although in better balance than earlier in the summer. Country trade is expected to develop not later than the middle of September, by which time the bulk of the grain crop will have been harvested and placed on the market. The demand for nails is unusually light, and prices lack strength. Production of this commodity is close to the low point of the year. Lack of buying by the railroads indicates that budget allowances for wire products have been depleted and that orders for the remainder of the year will be only of the size necessary to take care of immediate requirements. Specifications from the manufacturing trade, notably from makers of farm machinery, show a tendency to increase.

Bolts, Nuts and Rivets.—Contracts for the fourth quarter are being prepared and will be presented to the trade after Labor Day. According to present plans of producers, prices will be the same as those now ruling. Specifications show no improvement, and spot sales are unusually light.

Coke.—Shipments of by-product foundry coke are larger, now being close to local oven capacity. Prices are firm at $9.75, local ovens, and $10.25, delivered in the Chicago switching district.

Old Material.—The market is again extremely dull, at least from the viewpoint of consumer purchases. Specialties are moving in small lots, but activity in the heavy tonnage grades is confined almost wholly to dealers' efforts to cover contracts. Steel mills are now willing to take heavier shipments. It is generally understood that larger quantities of scrap are being used in steel production, now that rail rollings are lighter, and there is reason to believe that mill stocks were allowed to shrink and that they now are being rounded out slowly. The market for cast iron borings is tight. Although no recent sales to consumers have been made, dealers are finding it difficult to satisfy past obligations and are paying as high as $11 for supplies. In at least one instance a user has substituted busheling for borings. There is little evidence that producers of borings are accumulating that grade against a higher market; the shortage seems to be due entirely to the curtailed rate of shop operations in and around Chicago. A producer of cast iron borings has recently sold 250 tons at $11 per gross ton, delivered. Low price levels, as well as lack of demand, are holding back country scrap, and local yards are operating at a low rate. Railroad lists include 10,000 tons advertised by the Chicago & North Western, 4000 tons offered by the Chicago, Burlington & Quincy and 1000 tons by the Chicago, Milwaukee & St. Paul.

Prices delivered consumers' yards, Chicago:

Per Gross Ton	
Basic Open-Hearth Grades:	
Heavy melting steel	$12.00 to $12.50
Shoveling steel	12.00 to 12.50
Frogs, switches and guards, cut apart, and miscellaneous rails	14.00 to 14.50
Hydraulic compressed sheets	10.50 to 11.00
Drop forge flashings	9.25 to 9.75
Forged, cast and rolled steel carwheels	15.50 to 16.00
Railroad tires, charging box size	15.50 to 16.00
Railroad leaf springs, cut apart	15.50 to 16.00
Acid Open-Hearth Grades:	
Steel couplers and knuckles	14.25 to 14.75
Coil springs	15.50 to 16.00
Low phosphorus punchings	14.25 to 14.75
Electric Furnace Grades:	
Axle turnings	12.50 to 13.00
Blast Furnace Grades:	
Axle turnings	10.50 to 11.00
Cast iron borings	10.50 to 11.00
Short shoveling turnings	10.50 to 11.00
Machine shop turnings	7.50 to 8.00
Rolling Mill Grades:	
Iron rails	13.50 to 14.00
Rerolling rails	15.25 to 15.75
Cupola Grades:	
Steel rails less than 3 ft	15.50 to 16.00
Angle bars, steel	14.00 to 14.50
Cast iron carwheels	14.50 to 15.00
Malleable Grades:	
Railroad	14.50 to 15.00
Agricultural	13.50 to 14.00
Miscellaneous:	
*Relaying rails, 56 to 60 lb	23.00 to 25.00
*Relaying rails, 65 lb. and heavier	26.00 to 31.00
Per Net Ton	
Rolling Mill Grades:	
Iron angle and splice bars	14.00 to 14.50
Iron arch bars and transoms	19.00 to 19.50
Iron car axles	21.00 to 21.50
Steel car axles	18.00 to 18.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.75 to 11.25
No. 1 busheling	9.75 to 10.25
No. 2 busheling	5.75 to 6.25
Locomotive tires, smooth	13.75 to 14.25
Pipes and flues	8.00 to 8.50
Cupola Grades:	
No. 1 machinery cast	14.75 to 15.25
No. 1 railroad cast	13.75 to 14.25
No. 1 agricultural cast	13.25 to 13.75
Stove plate	13.00 to 13.50
Grate bars	11.75 to 12.25
Brake shoes	11.00 to 11.50

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforcing bars, billet steel	2.05c. to 2.15c.
Cold-finished steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands	3.65c.
Hoops	4.15c.
Black sheets (No. 24)	3.95c.
Galvanized sheets (No. 24)	4.80c.
Blue annealed sheets (No. 10)	3.50c.
Spikes, standard railroad	3.55c.
Track bolts	4.55c.
Rivets, structural	3.60c.
Rivets, boiler	3.60c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, squares, tapped or blank	60
Hot-pressed nuts, hexagons, tapped or blank	60
No. 8 black annealed wire, per 100 lb	$3.20
Common wire nails, base per keg	$2.85 to 2.95
Cement coated nails, base per keg	2.95

Chicago

Cargo of Iron Arrives from Cleveland—August Steel Bookings Disappointing

CHICAGO, Aug. 30.—August proved a disappointment to the steel trade, not alone from the standpoint of new business and specifications but also because the closing days of the month failed to give any definite sign pointing to higher operations in the early fall. Steel works blast furnace operations are lower by one furnace than in July and ingot production is down in like proportion, averaging about 65 per cent of capacity as the month comes to a close.

Sagging prices have added to the stress of the situation, and, in addition, rolling schedules have become so disarranged that many small buyers, requiring quick service, have turned to warehouses for their meager requirements. Scattered orders for a few cars each are all that the month can boast of in the way of railroad equipment business. Fabricators, seeing only a moderate amount of tonnage coming into the market, are more determined than ever to take orders and their prices have dropped at least $2 a ton in the last week or 10 days. On the brighter side of the market are well sustained orders for some classes of wire products, sheets, hot and cold-rolled strips, and a good late summer demand for reinforcing bars.

In the main, books for the fourth quarter will not be opened until after Labor Day. Sales of finished steel show some improvement but are still well below shipments, indicating a further decline in mill backlogs.

Pig Iron.—The cargo boat Henry Cort has been docked at Chicago with iron from Cleveland. This is the first of a number of water shipments against sales of 3500 tons in Chicago and 7000 tons in Milwaukee. Orders for this iron were taken at $19, delivered. Chicago producers of pig iron are holding their prices at $19.50, base furnace. Both sales and inquiries for Northern iron are more numerous. Sales in August exceeded shipments by a small margin, and shipments were the best in three months. Stocks in the hands of users are probably better balanced than a month ago. The trade believes that current shipments now closely approximate the actual melt of iron. Business among jobbing foundries is spotty, but manufacturers who operate foundries are working steadily, though at a lower rate than early in the summer. Fresh inquiries for foundry iron include 1000 tons for a user north of Chicago and 500 tons for an Indiana melter. Shipments of merchant iron are approximately equal to production. Charcoal iron is moderately active in carload lots at $27.04, delivered Chicago. Silvery is quiet at unchanged prices.

Prices per gross ton at Chicago:

Northern No. 2 foundry, sil. 1.75 to 2.25	$19.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	20.00
Malleable, not over 2.25 sil.	19.50
High phosphorus	19.50
Lake Superior charcoal, averaging sil. 1.50	27.04
Southern No. 2 fdy. (all rail)	23.26
Southern No. 2 (barge and rail)	21.43
Low phos., sil. 1 to 2 per cent, copper free	$31.50 to 32.00
Silvery, sil. 8 per cent	33.29
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—In new sales this market is dull. Specifications for ferromanganese and ferrosilicon total fairly large over an extended period of time, but individually they are small and represent the immediate requirements of users. Spot cars of 19 to 21 per cent spiegeleisen are moving at $33, Hazzard, Pa.

Prices delivered Chicago: 80 per cent ferromanganese, $97.56; 50 per cent ferrosilicon, $85 to $87.50; spiegeleisen, 18 to 22 per cent, $40.76 to $41.76.

Plates.—Two oil producers in the Southwest have ordered a total of 10,000 tons of plates for tank construction. This business with that placed in the last five weeks has added not less than 35,000 tons to Chicago mill books. Fresh inquiry is light, though producers estimate that about 5000 tons is still to be placed. Small orders for plates are numerous, particularly from boiler makers and manufacturers of small tanks, whose business usually follows the trend of building operations. Plate mills in this district are operating at 55 to 60 per cent of capacity, and deliveries on all sizes of plates are prompt. Specifications from car builders are light, the bulk of materials needed on recent large orders for cars already having been ordered out.

Mill prices on plates per lb.: 1.90c. to 2c., base, Chicago.

Structural Material.—Structural awards in Chicago total 9000 tons, the largest single letting being 6000 tons for the Bryn Mawr Beach Hotel. Competition among fabricators is unusually keen, and their prices appear to have reached a new low level for the year. Architects are redesigning the Medinah Athletic Club, and both the *Daily News* Building and the warehouse for Marshall Field & Co. are being delayed pending an agreement as to air rights. Mill prices on plain material are weak at 1.90c. to 2c., Chicago.

Mill prices on plain material per lb.: 1.90c. to 2c., base Chicago.

Reinforcing Bars.—This market is active both in terms of sales and fresh inquiries. The reinforcing bars for the Milliners Building, Chicago, 500 tons, have been placed, and Manly Junior High School, Chicago, will require 560 tons. Other new public school projects will take not less than 600 tons of bars. Prices are not definitely established. On billet steel bars old quotations at 2c. are still out, and it is doubtful whether the new price schedule is holding on new business. Rail steel bars are commonly quoted at 1.90c. to 2c., Chicago. Shops on the whole are well engaged, and new work in prospect is keeping engineers and architects busy. Awards and new inquiries are shown on page 588.

Bars.—Schedules calling for soft steel bars now being prepared by manufacturers of farm implements indicate that September deliveries to those users will be heavier than in August. Road machinery builders are specifying at a steady rate, and their order books promise to support a steady rate of output until winter manufacturing gets under way on machinery that is to be delivered in the spring. Specifications from cold-drawn bar makers are larger, showing a recovery from the slump experienced by that industry in midsummer. Specifications for soft steel bars are equal to shipments, but new buying is light. Ruling quotations in this territory range from 1.90c. to 2c., Chicago, the higher price being more common in Chicago than in outlying sections. Cold-drawn bar manufacturers are ordering out larger quantities of alloy steel bars. The demand for this commodity is steady, and prices are unchanged. Specifications for iron bars are heavier, but new buying is light and mills are operating on a hand-to-mouth basis. Demand for hard steel bars from the bed trade is showing improvement, and farm implement manufacturers are taking larger quantities. Shipments of fence posts are fair for this time of the year, and producers expect the fall trade in this commodity to open up in two or three weeks. Both Chicago Heights rail steel bar mills are operating on a double turn basis.

Mill prices per lb.: Soft steel bars, 1.90c. to 2c., base, Chicago; common bar iron, 2c., base, Chicago; rail steel bars, 1.90c., base, Chicago.

Cast Iron Pipe.—Royal Oak, Mich., has closed with the National Cast Iron Pipe Co. for 200 tons of 6-in. and 170 tons of 8-in. Class B pipe at close to $29, Birmingham. Fresh inquiry in this district includes 300 tons of 6-in. and 100 tons of 8-in. Class B pipe for Kenosha, Wis. Prices are easier on small lots, and local quotations range from $28 to $29, Birmingham, or $36.20 to $37.20 for 6-in. and larger diameters. Small orders are fairly numerous, but the aggregate tonnage of that kind of business has fallen below the average for the first three weeks of August. Public utilities and private buyers are inactive, but orders are coming from contractors at a steady rate. Although the summer buying movement has not developed as had been expected by the trade, the upward swing in orders from

contractors and the relatively large total tonnage of small orders have tended to hold in check the shrinkage in foundry order books. There are still some sizes of pipe that cannot be had in less than three weeks, but on the whole deliveries are prompt. At the moment makers of pipe are more concerned about obtaining a better balance of orders than larger bookings in miscellaneous sizes. Keen competition for certain diameters is largely responsible for the present low level of prices.

Prices per net ton, delivered Chicago: Water pipe, 6-in. and over, $36.20 to $37.20; 4-in., $40.20 to $41.20; Class A and gas pipe, $4 extra.

Rails and Track Supplies.—Reports that the Chicago, Milwaukee & St. Paul will soon come into the market for 20,000 to 25,000 tons of standard-section rails appear to be without foundation. Although several railroads are indicating interest in 1928 requirements, action on the only definite inquiry of note, that of the Chesapeake & Ohio, has been deferred for at least two weeks. Six miscellaneous orders for rails booked by Chicago mills total 6000 tons. This tonnage is for immediate shipment and does not represent advance requirements. Rail mill operations average about 35 per cent of capacity. Orders for light rails are in small volume, but the total business in August was the best in several months. Fresh inquiry is light. Orders for odd lots of track supplies total 4000 tons for the week. Operations in plants making track accessories have declined steadily, now being at about the same rate as ingot production.

Prices f.o.b mill, per gross ton: Standard-section open-hearth and Bessemer rails, $43; light rails, rolled from billets, $36 to $38. *Per Lb.:* Standard railroad spikes, 2.90c.; track bolts with square nuts, 3.90c.; steel tie plates, 2.35c.; angle bars, 2.75c.

Sheets.—Prices are steady for the current run of orders. These, for the most part, are individually small, but in the aggregate suffice to sustain mill operations in this district at a 75 per cent rate. Local buyers, particularly manufacturers, are taking out sheets at a steady rate, but orders from Southern jobbers are lighter. Price policies for the fourth quarter have not been announced.

Base prices per lb., delivered from mill in Chicago: No. 24 black, 3.15c.; No. 24 galvanized, 4c.; No. 10 blue annealed, 2.40c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Wire Products.—Shipments to the Missouri Valley and the South are growing. In and around Chicago the jobbing trade is slow, and there are no indications as to when a fall buying movement may get under way. It is generally believed that stocks in the hands of jobbers are low, although in better balance than earlier in the summer. Country trade is expected to develop not later than the middle of September, by which time the bulk of the grain crop will have been harvested and placed on the market. The demand for nails is unusually light, and prices lack strength. Production of this commodity is close to the low point of the year. Lack of buying by the railroads indicates that budget allowances for wire products have been depleted and that orders for the remainder of the year will be only of the size necessary to take care of immediate requirements. Specifications from the manufacturing trade, notably from makers of farm machinery, show a tendency to increase.

Bolts, Nuts and Rivets.—Contracts for the fourth quarter are being prepared and will be presented to the trade after Labor Day. According to present plans of producers, prices will be the same as those now ruling. Specifications show no improvement, and spot sales are unusually light.

Coke.—Shipments of by-product foundry coke are larger, now being close to local oven capacity. Prices are firm at $9.75, local ovens, and $10.25, delivered in the Chicago switching district.

Old Material.—The market is again extremely dull, at least from the viewpoint of consumer purchases. Specialties are moving in small lots, but activity in the heavy tonnage grades is confined almost wholly to dealers' efforts to cover contracts. Steel mills are now willing to take heavier shipments. It is generally understood that larger quantities of scrap are being used in steel production, now that rail rollings are lighter, and there is reason to believe that mill stocks were allowed to shrink and that they now are being rounded out slowly. The market for cast iron borings is tight. Although no recent sales to consumers have been made, dealers are finding it difficult to satisfy past obligations and are paying as high as $11 for supplies. In at least one instance a user has substituted busheling for borings. There is little evidence that producers of borings are accumulating that grade against a higher market; the shortage seems to be due entirely to the curtailed rate of shop operations in and around Chicago. A producer of cast iron borings has recently sold 250 tons at $11 per gross ton, delivered. Low price levels, as well as lack of demand, are holding back country scrap, and local yards are operating at a low rate. Railroad lists include 10,000 tons advertised by the Chicago & North Western, 4000 tons offered by the Chicago, Burlington & Quincy and 1000 tons by the Chicago, Milwaukee & St. Paul.

Prices delivered consumers' yards, Chicago:

Per Gross Ton	
Basic Open-Hearth Grades:	
Heavy melting steel	$12.00 to $12.50
Shoveling steel	12.00 to 12.50
Frogs, switches and guards, cut apart, and miscellaneous rails	14.00 to 14.50
Hydraulic compressed sheets	10.50 to 11.00
Drop forge flashings	9.25 to 9.75
Forged. cast and rolled steel carwheels	15.50 to 16.00
Railroad tires, charging box size	15.50 to 16.00
Railroad leaf springs, cut apart	15.50 to 16.00
Acid Open-Hearth Grades:	
Steel couplers and knuckles	14.25 to 14.75
Coil springs	15.50 to 16.00
Low phosphorus punchings	14.25 to 14.75
Electric Furnace Grades:	
Axle turnings	12.50 to 13.00
Blast Furnace Grades:	
Axle turnings	10.50 to 11.00
Cast iron borings	10.50 to 11.00
Short shoveling turnings	10.50 to 11.00
Machine shop turnings	7.50 to 8.00
Rolling Mill Grades:	
Iron rails	13.50 to 14.00
Rerolling rails	15.25 to 15.75
Cupola Grades:	
Steel rails less than 3 ft	15.50 to 16.00
Angle bars, steel	14.00 to 14.50
Cast iron carwheels	14.50 to 15.00
Malleable Grades:	
Railroad	14.50 to 15.00
Agricultural	13.50 to 14.00
Miscellaneous:	
*Relaying rails, 56 to 60 lb	23.00 to 25.00
*Relaying rails, 65 lb. and heavier	26.00 to 31.00
Per Net Ton	
Rolling Mill Grades:	
Iron angle and splice bars	14.00 to 14.50
Iron arch bars and transoms	19.00 to 19.50
Iron car axles	21.00 to 21.50
Steel car axles	18.00 to 18.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.75 to 11.25
No. 1 busheling	9.75 to 10.25
No. 2 busheling	5.75 to 6.25
Locomotive tires, smooth	13.75 to 14.25
Pipes and flues	8.00 to 8.50
Cupola Grades:	
No. 1 machinery cast	14.75 to 15.25
No. 1 railroad cast	13.75 to 14.25
No. 1 agricultural cast	13.25 to 13.75
Stove plate	13.00 to 13.50
Grate bars	11.75 to 12.25
Brake shoes	11.00 to 11.50

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforcing bars, billet steel	2.05c. to 2.15c.
Cold-finished steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands	3.65c.
Hoops	4.15c.
Black sheets (No. 24)	3.95c.
Galvanized sheets (No. 24)	4.80c.
Blue annealed sheets (No. 10)	3.50c.
Spikes, standard railroad	3.55c.
Track bolts	4.55c.
Rivets, structural	3.60c.
Rivets, boiler	3.60c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, squares, tapped or blank	60
Hot-pressed nuts, hexagons, tapped or blank	60
No. 8 black annealed wire, per 100 lb	$3.20
Common wire nails, base per keg	$2.85 to 2.95
Cement coated nails, base per keg	2.95

New York

Pig Iron Market in Steadier Position—Steel Buying Still Lags

NEW YORK, Aug. 30.—The pig iron market appears to be in a steadier position, although it is doubtful whether advances in prices have found any basis in sales. There is less anxiety among producers to obligate themselves further at the low prices that have ruled of late. While the recent buying movement has been at the expense of prices, most of the furnaces have accumulated comfortable backlogs. Moreover, competition has been rendered less keen by the recent blowing out of one of the Eastern stacks and the pooling of the sales of two Buffalo producers. While melters have been buying conservatively, placing orders because of the low prices rather than because of expanding foundry operations, their commitments are estimated as representing close to 85 per cent of their probable consumption for the remainder of the year. While it is unlikely that more than 60 to 70 per cent of the probable production of merchant iron in this district for the rest of the year has been sold, it is believed that furnaces are sufficiently well booked so that they will not feel in pressing need of additional business until late in October or early November. Sales by local brokers during the past week totaled 15,000 tons, of which more than 10,000 tons was booked by one selling agency. Orders called for low phosphorus and Dutch foundry iron, as well as domestic foundry grades. The National Radiator Co. has placed 3000 tons for foundry for fourth quarter delivery at Trenton, N. J., and still has several thousand tons to buy. The Ulster Iron Works, Dover, N. J., has closed for 2500 tons of gray forge, having placed the major part of it with an eastern New York furnace and the remainder with a Buffalo producer. The Louis Sacks Iron Foundry, Newark, N. J., has placed 700 tons of foundry, and the Farrel Foundry & Machine Co., Ansonia, Conn., has bought 300 tons of off-Bessemer. The Moore Brothers Co., Elizabeth, N. J., is inquiring for 750 tons of No. 1X and 500 tons of Bessemer for September to December shipment.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25 (all rail)	$20.91 to $21.41
No. 2 plain fdy. (by barge, del'd alongside in lighterage limits N. Y. and Brooklyn)	18.00 to 19.00
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	20.89 to 22.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	21.39 to 22.52
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	21.89 to 23.02

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.

Finished Steel.—Steel buying is still lagging, and there has been nothing in the business of the past week to distinguish it from the small-lot ordering of the other weeks of midsummer. While some companies, principally those making a variety of products, continue to report a slight gain in August business over that of July, other companies whose products are limited to one or two items see no marked improvement. Despite the efforts of some mills to bring about a better price situation on structural shapes, the chaotic conditions of recent months seem to continue, but prices on other lines of finished steel show a degree of firmness not usual when mills are so much in need of tonnage. The only weakening in the sheet price situation is declared to be due to resales by jobbers of tonnage they are getting on contracts, sales having been made of black and galvanized sheets at $2 a ton under published quotations. The mills, however, appear to be adhering rigidly to established prices and some of the largest consumers, ordinarily favored with concessions, are paying the full prices. Demand for plates is light, but prices remain at 1.75c. to 1.80c., Pittsburgh. In all finished steel lines the orders of railroads, jobbers and consumers are being pared to a minimum, specifications against contracts in some instances being so small that railroad requisitions for such items as 10 bars and for five sheets are sent to the mills rather than to warehouses. Close to 28,000 tons of structual steel fabricated will be required shortly by New York subways, including a repair shop that will take 12,000 tons and the Nassau Street subway extension, which will be readvertised, first bids having been rejected.

Mill prices per lb. delivered New York: Soft steel bars, 2.14c.; plates, 2.09c. to 2.14c.; structural shapes, 1.90c. to 2.04c.; bar iron, 2.14c.

Warehouse Business.—Purchasing from stock is still limited to small lots, but a few jobbers report a slight increase in the number of orders in the past week. Structural material is moving in fair volume, and prices are firm. Black and galvanized sheets continue to show a slight tendency toward softness, with shading of 5c. to 10c. per 100 lb. occasionally reported on desirable lots. Sellers look forward to the beginning of better fall business after Labor Day.

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.34c.
Soft steel bars and small shapes	3.24c.
Iron bars	3.24c.
Iron bars, Swedish charcoal	7.00c. to 7.25c.
Cold-finished steel shafting and screw stock—	
Rounds and hexagons	4.00c.
Flats and squares	4.50c.
Cold-rolled strip, soft and quarter hard,	5.75c. to 6.25c.
Hoops	4.49c.
Bands	3.99c.
Blue annealed sheets (No. 10 gage)	3.89c.
Long terne sheets (No. 24 gage)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galvanized annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.
Machine bolts, cut thread:	Per Cent Off List
¾ x 6 in. and smaller	55 to 60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	55 to 60
¾ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller	55 to 60
1 x 16 in. and smaller	50 to 50 and 10
Boiler Tubes—	Per 100 Ft.
Lap welded steel, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
⅛-in. butt	46	29
¼-in. butt	51	37
⅜-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
⅛-in. butt	4	+19
¼-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	4.00c.
No. 22	4.15c.
No. 24	4.20c.
No. 26	4.30c.
No. 28*	4.45c.
No. 30	4.70c.

Sheets, Galvanized

	Per Lb.
No. 14	4.35c. to 4.60c.
No. 16	4.45c. to 4.70c.
No. 18	4.60c.
No. 20	4.75c.
No. 22	4.80c.
No. 24	4.95c.
No. 26	5.20c.
No. 28*	5.45c.
No. 30	5.85c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Ferroalloys.—An inquiry for 200 tons of ferromanganese is reported, but otherwise the market is exceedingly stagnant with hardly any inquiries or sales of carload and small lots. There is practically no new business in spiegeleisen although a sale of a small amount of imported alloy is noted. Prices are firm and unchanged. Specifications on contract, particularly for ferromanganese, are very sluggish although there has been some improvement in customers' demands for ferrosilicon and ferrochromium.

Reinforcing Bars.—Business continues quiet, with a few scattered lettings of more than 100 tons. The largest inquiry that has come out in the last week is for a loft building in Manhattan which will take 500 tons. New business is not coming out at a rate that will keep estimating offices busy, and old work has been largely completed. The greater part of the bars purchased last week for the Mergenthaler building in Brooklyn is reported to have been bought at a concession, but this is hardly a criterion of the market, which is fairly stable at the following prices:

Prices per lb. on billet steel reinforcing bars: From mill, 1.90c., Pittsburgh. Out of New York warehouse, 3.05c. to 3.15c., delivered at job. Out of Youngstown warehouse, 2.40c., Youngstown, or 2.77½c., delivered New York.

Old Material.—Prices of most grades are unchanged, and the market is still inactive. The downward trend, however, seems to have temporarily ceased, and in a few cases consumers are reported to be showing more interest in making purchases than for some time. No. 1 heavy melting steel is unchanged at $13.50 per ton, delivered to eastern Pennsylvania mills, with shipments largely confined to Bethlehem, Phoenixville, Pa., and Claymont, Del. Yard grade is being purchased at $10.50 per ton, Pottsville, and at $11.50 to $12 per ton, delivered Harrisburg, Pa. Steel mill stove plate is quoted at $13 per ton, delivered Harrisburg, and cast borings at $11.50 per ton for the same delivery. Specification pipe is quiet, with shipments going to Lebanon, Pa., at $12 per ton, delivered. The market on turnings and borings and turnings is unchanged, with shipments of turnings going to Harrisburg and Phoenixville and borings and turnings to Bethlehem, Pa. Chemical borings are being purchased at $15.25 per ton, delivered Gibbstown, N. J.

Dealers' buying prices per gross ton, New York:

No. 1 heavy melting steel	$10.00 to $10.85
Heavy melting steel (yard)	7.00 to 8.00
No. 1 heavy breakable cast	11.25 to 12.50
Stove plate (steel works)	8.75 to 9.25
Locomotive grate bars	8.00 to 8.50
Machine shop turnings	7.00 to 7.50
Short shoveling turnings	7.00 to 7.50
Cast borings (blast furnace or steel works)	7.25 to 7.75
Mixed borings and turnings	7.00 to 7.50
Steel car axles	15.75 to 16.25
Iron car axles (nom.)	23.00 to 23.50
Iron and steel pipe (1 in. diam., not under 2 ft. long)	8.25
Forge fire	6.50 to 7.00
No. 1 railroad wrought	11.50 to 12.00
No. 1 yard wrought, long	10.50 to 11.00
Rails for rolling	10.25 to 10.75
Cast iron carwheels	11.50 to 12.00
Stove plate (foundry)	9.00 to 9.75
Malleable cast (railroad)	10.75 to 11.25
Cast borings (chemical)	11.50 to 12.00

Prices per gross ton, delivered local foundries:

No. 1 machinery cast	$14.00 to $14.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	12.50 to 13.00
No. 2 cast (radiators, cast boilers, etc.)	11.50 to 12.00

Cast Iron Pipe.—As a result of the low prices that are being quoted, a few makers have apparently been able to secure a backlog sufficient for the next month or more, but there is still plenty of keen competition for the small volume of business appearing. While the market is quotable at $29 to $30 per ton, base Birmingham, slightly less than this has been done occasionally. The 5000 tons, or more, for the city of New York has not yet come into the market. Meanwhile, the Department of Water Supply, Gas and Electricity, New York, opens bids Sept. 6 on a contract for furnishing and installing a small tonnage of pipe in the Borough of Bronx. Putnam, Conn., opens bids Sept. 8 on about 500 tons of water pipe. Among recent purchases are: Hagerstown, Md., about 6000 tons to the Lynchburg Foundry Co.; Washington, D. C., about 1100 tons of 12-in. water pipe to the National Cast Iron Pipe Co.; Hodenpyl Hardy & Co., New York, about 500 tons of gas pipe for Flint, Mich., from the National Cast Iron Pipe Co. The American Construction & Securities Co., New York, has closed on about 500 tons of water pipe for Powderly, Ala., and Dedham, Mass., has placed about 250 tons of water pipe.

Prices per net ton, delivered New York: Water pipe 6-in. and larger, $38.25 to $39.25; 4-in. and 5-in., $43.25 to $44.25; 3-in., $53.25 to $54.25; Class A and gas pipe, $4 to $5 extra.

Coke.—Consumers are beginning to show a more lively interest in accumulating stocks, but prices are practically unchanged, with prompt shipment foundry at $4.25 to $4.50 per net ton, Connellsville, and special brands ranging up to $5 and $5.50. On forward shipments producers are quoting higher prices, even on short term deliveries of 30 days or more, apparently expecting an upward movement of the market. Standard furnace ranges from $3 to $3.25 per net ton, Connellsville, for prompt shipment. Delivered prices on Connellsville foundry coke are: to northern New Jersey, $8.03 to $8.28; to New York or Brooklyn, $8.79 to $9.04; to Newark or Jersey City, N. J., $7.91 to $8.16. Prices on by-product foundry coke are unchanged at $9.59 to $10.77 per net ton, delivered Newark or Jersey City.

Cleveland

Steel Demand Reflects Curtailed Operations of Consuming Industries

CLEVELAND, Aug. 30.—Evidences of an increase in the demand for finished steel are lacking. August is closing with little change in the situation as compared with a month ago, although this month will show up slightly better than July in the aggregate volume of sales. Business with consuming industries has not picked up, and not much gain in steel orders can be looked for until metal-working plants increase their operations. While some orders for steel bars are for 100 tons or more, the bulk of the business is in small lots for immediate needs. Consumers are keeping their stocks at a minimum and, as a rule, want shipments within a very few days.

There is very little call for plates, and the demand for structural material is limited to small lots. The Cleveland Union Terminals Co. has sent out an inquiry for bridge work in connection with the new union depot requiring 2500 tons of fabricated steel, but little new work is coming out in the building field. Orders from the lake shipbuilding industry are small, being limited to material for repair work.

The market has a firm tone on nearly all finished steel products. Steel bars and plates are holding to 1.80c., Pittsburgh. Buyers appear satisfied with the price, and little effort is being made to secure concessions. The small-lot sales of structural shapes that are being made are at the same price. The Cleveland mill price on steel bars is steady at 1.80c., Cleveland.

Pig Iron.—The market continues fairly active, with sales by Cleveland interests during the week aggregating 30,000 tons, in foundry and malleable grades, or the same total as during the previous week. The amount of business taken by these producers during August will aggregate approximately 175,000 tons, or about 20 per cent less than during July, when sales exceeded any previous month of the year. Shipments

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	3.00c.
Reinforcing steel bars	2.25c. to 3.00c.
Cold-finished rounds and hexagons	3.65c.
Cold-finished flats and squares	4.15c.
Hoops and bands	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.75c.
Galvanized sheets (No. 24)	4.65c.
Blue annealed sheets (No. 10)	3.25c.
No. 9 annealed wire, per 100 lb	$2.90
No. 9 galvanized wire, per 100 lb	3.35
Common wire nails, base per keg	2.90

*Net base, including boxing and cutting to length.

this month show considerable gain over July. Buying is fairly well scattered among industries and territories served by Cleveland producers. The Standard Sanitary Mfg. Co. purchased 3000 tons of foundry iron from a Lake furnace. Other round-lot sales include 2000 tons bought by the American Radiator Co. for its Springfield, Ohio, plant and 1500 tons of malleable iron purchased by an Indiana melter. While $17.50, furnace, is being rather generally maintained on foundry and malleable iron by Lake producers, weak spots are appearing in the market. Sales of foundry iron were made by a Cleveland producer during the week at $17.25, furnace, in the northern Ohio territory, where the seller had no freight disadvantage to overcome. For Cleveland delivery local furnaces are holding to $18.50, furnace. In the Valley district $17.50, furnace, is rather generally quoted, although $18 has not disappeared. In Michigan $18.50, furnace, is the ruling price, but in some cases this has been shaded or the silicon differential has been waived. Shipping orders for low phosphorus iron show considerable gain over last month, but no new business is coming out.

Prices per gross ton at Cleveland:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$19.00
Southern fdy., sil. 1.75 to 2.25	23.25
Malleable	19.00
Ohio silvery, 8 per cent	31.50
Basic, Valley furnace	17.25
Standard low phos., Valley fur	27.50

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Semi-Finished Steel.—There is very little new business, and specifications are light. Prices are holding to $34, Cleveland and Youngstown, for sheet bars and $33 for large billets and slabs.

Sheets.—The demand continues light. Leading consuming industries outside of the automotive field, including stamping, stove, metal furniture and barrel manufacturers, are not very busy and are ordering sheets sparingly. Orders from the automotive industry are only moderate. The Ford Motor Co. is still buying limited quantities for its first small lot of new model cars, which leads to the conclusion that it will be several weeks before the company gets under production in a large way. In spite of the dullness, regular prices are being well maintained. The only irregularity reported is on blue annealed sheets, which in a limited range of widths can be purchased on a strip sheet basis, or equivalent to a base sheet price of 2.15c., Pittsburgh, or $2 a ton below the ruling blue annealed price.

Strip Steel.—Cold-rolled strip is moving in fair volume, and producers are holding to the regular base price of 3.25c., Cleveland. The demand for hot-rolled strip is very slow. Mills have cleaned up on orders for low-priced strip, and orders that are being placed are going at the present prices of 2.10c., Pittsburgh, for wide strip and 2.30c. for narrow material.

Cold-Finished Steel Bars.—There is not much new business, and prices are still irregular, although leading producers report that they are not going below 2.30c., Cleveland.

Reinforcing Bars.—New demand is slow, and practically all the local business is going to Cleveland mills, which are quoting new billet steel bars at 1.80c., mill. Rail steel bars are unchanged at 1.65c., mill.

Warehouse Business.—Orders are fair. The August volume of bookings will show little change from July. Sheets are not so active as they have been, but prices are holding fairly well. Other warehouse prices are firm.

Bolts, Nuts and Rivets.—The demand for bolts and nuts continues rather slow, with orders limited to small lots. Prices are being maintained. Rivets are also quiet, although orders show a slight gain.

Coke.—By-product coke for domestic use has become more active, as yards are stocking up. The demand is largely for egg coke, which is bringing $4.75 per ton at ovens. Producers predict an advance. The demand for foundry coke is limited to specifications against contracts. Prices are unchanged at $4 to $5.35, ovens, for standard Connellsville grades.

Old Material.—The market is not so firm as recently, and heavy melting steel and blast furnace grades are being offered more freely by dealers at the prices that have been prevailing. Dealers having short orders are also able to secure slight concessions from the prices that they have been paying of $14.25 and $13.75 for Nos. 1 and 2 heavy melting steel. Small lots of blast furnace scrap are bringing $11.25. There is no new demand from the mills, and dealers are waiting for an improved demand for steel from the automotive industry to stimulate the call for scrap. Machine shop turnings are 25c. a ton lower. Dodge Brothers, Inc., Detroit, has issued its September scrap list of 3000 tons.

Prices per gross ton, delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$14.00 to $14.25
No. 2 heavy melting steel	13.50 to 13.75
Compressed sheet steel	13.25 to 13.50
Light bundled sheet stampings	11.50 to 12.00
Drop forge flashings	12.50 to 13.00
Machine shop turnings	9.00 to 9.25
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	13.75 to 14.00
No. 1 busheling	11.50 to 11.75
Pipes and flues	10.00 to 10.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades	
Low phosphorus forging crops	16.50 to 17.00
Low phosphorus, billet bloom and slab crops	17.00 to 17.50
Low phosphorus sheet bar crops	16.00 to 16.50
Low phosphorus plate scrap	16.00 to 16.50
Blast Furnace Grades	
Cast iron borings	10.75 to 11.00
Mixed borings and short turnings	10.75 to 11.00
No. 2 busheling	10.75 to 11.00
Cupola Grades	
No. 1 cast	16.50 to 17.00
Railroad grate bars	12.00 to 12.50
Stove plate	12.00 to 12.50
Rails under 3 ft	18.00 to 18.50
Miscellaneous	
Railroad malleable	15.50 to 16.00
Rails for rolling	16.25 to 16.50

Philadelphia

No Definite Trend in Markets—Volume Continues Small—Prices Unchanged

PHILADELPHIA, Aug. 30.—There is no definite trend in the pig iron and finished steel markets. Expectations that the approach of September would quicken the pulse of business have not materialized, and there is nothing to distinguish today's situation from that which has existed through July and August. While hope springs from intangible sources that the fourth quarter of the year will show a much better condition, it is plain that there is little in the present situation upon which sound forecasts can be based. The market is featureless. The volume both in finished steel and pig iron remains about the same as in recent weeks, and prices show no change, notwithstanding the urgent need of producers for tonnage.

Pig Iron.—The Baldwin Locomotive Works has inquired for 2500 tons of special grades known as floor

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.80c. to 3.00c.
Plates, ⅜-in.	3.00c. to 3.20c.
Structural shapes	2.65c. to 3.00c.
Soft steel bars, small shapes and iron bars (except bands)	2.70c. to 3.20c.
Round-edge iron	3.50c.
Round-edge steel, iron finished, 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforcing steel bars, square, twisted and deformed	3.00c.
Cold-finished steel, rounds and hexagons	4.00c.
Cold-finished steel, squares and flats	4.50c.
Steel hoops	3.85c. to 4.15c.
Steel bands, No. 12 gage to ⅛-in., inclusive	3.60c. to 3.90c.
Spring steel	5.00c.
Black sheets (No. 24)	4.35c.
Galvanized sheets (No. 24)	5.20c.
Blue annealed sheets (No. 10)	3.30c.
Diamond pattern floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

and cylinder iron for delivery at the rate of 150 tons a week. Otherwise there is no large inquiry in the market, at least a part of the tonnage required by the National Radiator Corporation having been purchased, it is reported. A Virginia cast iron pipe company has bought 6000 tons of foundry iron from a furnace in that State. Prices on foundry iron remain unchanged at $20, base, eastern Pennsylvania furnace. A small lot of low phosphorus iron for shipment to the Pittsburgh district has been sold at $25, Eastern furnace. In the southern section of the Atlantic seaboard territory Alabama furnaces have quoted $16.75, Birmingham, on foundry iron.

Prices per gross ton at Philadelphia:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$20.76 to $21.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.26 to 21.76
East. Pa. No. 1X	21.76 to 22.26
Basic (delivered eastern Pa.)	20.00
Gray forge	20.50 to 21.00
Malleable	21.50 to 22.00
Standard low phos. (f.o.b. New York State furnace)	25.00
Copper bearing low phos. (f.o.b. furnace)	24.50 to 25.00
Virginia No. 2 plain, 1.75 to 2.25 sil.	26.17
Virginia No. 2X, 2.25 to .75 sil.	26.67

Prices, except on low phosphorus, are delivered Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $5.17 from Virginia furnaces.

Plates.—Eastern plate mills continue to get orders in about the volume of recent weeks. Prices are holding fairly well at 1.75c. and 1.80c., Pittsburgh. The rate of mill operations shows no increase.

Structural Shapes.—The latter part of August has been rather disappointing to structural mills that had expected a rise in the volume of demand. Although a fair amount of fabricated steel work is up for bids in this district, this business will not come to the mills until later, and current orders are showing no gain. The price situation continues unchanged. Quotations on carload lots are usually 1.70c. and 1.75c., Pittsburgh, but on larger lots concessions of $2 a ton, sometimes more, are granted to preferred buyers.

Bars.—The carlot price for merchant steel bars continues at 1.80c., Pittsburgh, while for concrete bars 1.90c., Pittsburgh, is quoted. These prices seem to be fairly firm, but the volume of buying is scarcely large enough to afford any real test. Eastern bar iron mills quote bar iron at 2.12c., Philadelphia.

Sheets.—Orders are being received every day by sheet mills at the full published prices, but some of the larger consumers have yet to make a real test of the market, as they are still getting shipments against second quarter contracts.

Imports.—Last week's receipts at Philadelphia of iron, steel, ore, etc., from abroad were as follows: Pig iron, 500 tons from France and 403 tons from India; structural shapes, 135 tons from France and 76 tons from Belgium; steel bars, 64 tons from Sweden; iron ore, 6599 tons from Algeria; manganese ore, 1500 tons from India and 12 tons from Germany.

Old Material.—The strength of the scrap market is most apparent this week in machine shop turnings, bundled sheets, stove plate and grate bars and heavy breakable cast. There has been no advance in price on any grade, but the demand keeps up fairly well, particularly from brokers who are engaged in filling contracts. One user of machine shop turnings has paid $11.50, delivered, and while another company has not offered above $11, it is picking up only small lots at that price.

Prices per gross ton, delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$14.00
Scrap T rails	$13.00 to 13.50
No. 2 heavy melting steel	11.50 to 12.00
No. 1 railroad wrought	15.50 to 16.00
Bundled sheets (for steel works)	11.00 to 11.50
Machine shop turnings (for steel works)	11.00 to 11.50
Heavy axle turnings (or equivalent)	12.50 to 13.00
Cast borings (for steel works and rolling mill)	11.50 to 12.00
Heavy breakable cast (for steel works)	15.50 to 16.00
Railroad grate bars	13.00 to 13.50
Stove plate (for steel works)	13.00 to 13.50
No. 1 low phos., heavy, 0.04 per cent and under	18.50 to 19.50
Couplers and knuckles	16.75
Rolled steel wheels	16.00
No. 1 blast furnace scrap	10.50
Machine shop turnings (for rolling mill)	11.50 to 12.00
Wrought iron and soft steel pipes and tubes (new specifications)	12.50
Shafting	17.50 to 18.00
Steel axles	19.00 to 20.00
No. 1 forge fire	11.00
Steel rails for rolling	16.00 to 16.50
Cast iron carwheels	15.50
No. 1 cast	16.00 to 16.50
Cast borings (for chemical plant)	15.00 to 15.50

Large Track Bolts Put on List and Discount Basis

In line with the program of simplification under which manufacturers of bolts and nuts revised the list prices on most of their products on April 1 and applied a uniform 70 per cent discount, leading manufacturers are putting all standard sizes of track bolts on a list and discount basis. This replaces the present plan of having two methods of quoting: one, covering small track bolts (from ⅜ to ¾ in. in diameter), on a list and discount basis, and the other, covering large track bolts (13/16 to 1⅛ in.), on a dollars per 100-lb. basis. Incidentally, small track bolts were first put on a list and discount basis April 1.

The entire new list is subject to discounts of 60 to 70 per cent off, according to the size of the order. Lots of less than 5 kegs of a size (instead of 10 kegs on the April 1 list for small track bolts) take a 10 per cent higher list instead of $1 per keg extra. A size is defined as one length of one diameter.

While there is apparently a general move among manufacturers to adopt the all-inclusive list, reports from Chicago indicate that the policy of selling large track bolts on the basis of a price per 100 lb. has not been abandoned by makers in that district. The complete new list, which is unchanged for small sizes and includes the added prices for the sizes over ¾ in. in diameter, follows:

TRACK BOLTS, UNITED STATES STANDARD ROLL THREAD

With Button Heads, Oval Necks, United States Standard Square Nuts
In 200-Lb. Kegs
Manufacturers' Standard List per 100 Pieces

Length in Inches	Diameter in Inches: ⅜	7/16 and ½	9/16 and ⅝	¾	13/16 and ⅞	15/16 and 1	1 1/16 and 1⅛
1	$2.75	....	....	....	....	....	....
1¼	2.90	$4.35	....	....	....	....	....
1½	3.10	4.55	$7.00	....	....	....	....
2	3.40	5.00	7.50	$10.75	....	....	....
2½	3.75	5.45	8.00	11.40	....	....	....
3	4.05	5.90	8.50	12.05	$16.25	....	....
3½	4.40	6.35	9.00	12.70	17.50	$23.15	....
4	....	6.80	9.50	13.35	18.75	24.90	$36.75
4½	....	....	....	14.00	20.00	26.65	38.05
5	....	....	....	14.65	21.25	28.40	39.35
5½	....	....	....	15.30	22.50	30.15	40.65
6	....	....	....	15.95	23.75	31.90	41.95

San Francisco

Large Structural Award — Buying Generally Is in Small Lots

SAN FRANCISCO, Aug. 27 (*By Air Mail*).—Featuring the market this week was an award of 2700 tons of structural shapes for the Earle C. Anthony Building at Los Angeles to the Llewellyn Iron Works, one of the largest lettings of the year, and inquiries for 1300 tons of cast iron pipe for Pasadena and 400 tons of steel pipe for the Pacific Gas & Electric Co., San Francisco. Hand-to-mouth buying continues to prevail, and little interest is being displayed in future requirements. Stocks in consumers' and distributers' warehouses are by no means rounded out, and in some items sizes are badly broken. Prices, generally, are considered firm.

Pig Iron.—Jobbing foundries are operating on limited schedules, with just sufficient orders coming in to keep them going from day to day. Activity in the southern part of the State has been curtailed to a considerable extent by the slowing down of operations in the oil fields. So far as can be ascertained, inquiries and sales of both foundry iron and coke were confined to small lots for prompt shipment. Prices are unchanged.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah foundry, sil. 2.75 to 3.25	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25	25.00
**German foundry, sil. 2.75 to 3.25	24.25

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Shapes.—Awards of structural shapes totaled over 3000 tons for the week, while pending business calls for more than 10,000 tons. Among the more important projects placed, in addition to the 2700 tons for the Anthony Building at Los Angeles, were 325 tons for the Mutual Stores in Oakland, Cal., and 180 tons for a bridge at Boise, Idaho. New business includes 1200 tons for the Foreman & Clark Building, Los Angeles, and 1000 tons for an arena in San Francisco. Prices on plain material are firm at 2.40c., c.i.f. Coast ports.

Plates.—The only sizable plate award of the week was 100 tons for a tank and tower at San Diego, Cal. Demand is practically at a standstill, as there are no projects of importance before the trade for figures this week. Eastern mills continue to quote 2.40c., c.i.f. Coast ports.

Reinforcing Bars.—The bulk of the going business continues to involve relatively small lots. Lettings this week did not exceed 600 tons. The largest award called for 314 tons for the Fourth Street bridge at Los Angeles, placed with an unnamed interest. New inquiries include 140 tons for a highway project at Redlands, Cal. San Francisco jobbers continue to quote 2.75c. to 2.85c., base, per lb. on lots of 200 tons or more and from 3c. to 3.10c. for less-than-carload shipments.

Cast Iron Pipe.—Demand apparently is on the increase, and several municipalities have come into the market this week for fair-sized lots. The National Cast Iron Pipe Co. secured the largest award of the week, 145 tons for Alhambra, Cal. The city of Walla Walla, Wash., placed 100 tons of 4 and 12-in. centrifugal pipe for a sewage disposal plant with the United States Cast Iron Pipe & Foundry Co. and the Pacific States Cast Iron Pipe Co. Burlingame, Cal., rejected all bids on 781 tons of 8 to 16-in. Class B pipe and will buy in the open market. Pasadena, Cal., will open bids on Sept. 1 for 1300 tons of 6 to 10-in. Classes B and C pipe, and El Segundo, Cal., is taking bids, to be opened Sept. 16, for 315 tons of 4 to 10-in. Class B pipe. Bids have been opened on 160 tons of 6 to 10-in. Class C pipe for the Twenty-seventh Street improvement job at San Diego, Cal.

Steel Pipe.—The largest order of the week was secured by the United States Steel Products Co. and called for 500 tons of 3½ and 4½-in. lapwelded pipe. The Crane Co. has booked 145 tons of ½ to 2-in. standard pipe, black and galvanized, for Los Angeles. An inquiry from the Pacific Gas & Electric Co., San Francisco, for 278 tons of 2-in. standard black pipe with line pipe couplings has been withdrawn, and a new inquiry is current for 15,000 ft. of 2-in. standard black plain-end pipe and 100,000 ft. of 3½-in. outside diameter pipe. Bids have been received on 500 tons of ¼ to 3½-in. standard black pipe for the Western Harvester Co. at Stockton, Cal.

Bars and Hoops.—Demand for merchant bars is light, and sales and inquiries recently have been confined to small lots embracing numerous sizes. The Standard Oil Co. has an inquiry out for 200 tons of hoops. Mill prices on hoops range from 2.75c. to 2.85c. per lb., c.i.f. Coast ports, Eastern producers having absorbed the increase in the ocean freight rate that went into effect on Aug. 1.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.10c.
Small angles, ⅞-in. and over	3.10c.
Small angles, under ⅞-in.	3.60c.
Small channels and tees, ¾-in to 2¾-in.	3.70c.
Spring steel, ¼-in. and thicker	5.10c.
Black sheets (No. 24)	3.85c.
Blue annealed sheets (No. 10)	4.90c.
Galvanized sheets (No. 24)	5.45c.
Structural rivets, ½-in. and larger	5.50c.
Common wire nails, base per keg	$3.45
Cement coated nails, 100-lb. keg	3.45

St. Louis

Melters Build Up Reserve Stocks of Coke —Scrap Still Advancing

ST. LOUIS, Aug. 30.—While the potential demand for pig iron continues decidedly good, actual sales have fallen sharply as contrasted with the preceding week, when over 25,000 tons was booked. Sales during the past seven days totaled about 2000 tons, generally distributed in lots ranging from single cars to 200 tons. The entire tonnage was foundry iron for delivery through the remainder of this year. Many purchasing agents and salesmen are away on vacations, and upon their return considerable business now in sight is expected to be closed. Consuming industries report a slight increase in orders for their own products, and feeling in the trade is more optimistic than for some time. Pig iron prices are firm.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25 f.o.b. Granite City, Ill.	$19.50 to $20.00
Northern No. 2 fdy., delivered St. Louis	21.66
Southern No. 2 fdy., delivered	21.67
Northern malleable, delivered	21.66
Northern basic, delivered	21.66

Freight rates: 81c. from Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Coke.—Users of metallurgical coke, apprehensive because of the failure of successive efforts to settle the bituminous coal strike, are quietly building up their reserve stocks. Some new business has been placed, and on all sides contract quotas are being taken when due. Foundry melt has gained slightly in the past 10 days and is being reflected in somewhat heavier deliveries of coke. Domestic sizes are quiet at the moment,

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
Black sheets (No. 24)	4.80c.
Galvanized sheets (No. 24)	5.35c.
Blue annealed sheets (No. 10)	3.60c.
Black corrugated sheets	4.65c.
Galvanized corrugated sheets	5.30c.
Structural rivets	3.60c.
Boiler rivets	3.80c.
	Per Cent Off List
Tank rivets, ⅞-in. and smaller	70
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, squares, blank or tapped	60
Hot-pressed nuts, hexagons, blank or tapped	60

but demand for industrial coke is holding its own. Prices are unchanged.

Finished Iron and Steel.—Interest at the moment centers in construction material, with reinforcing bars the most active item in that category. Producers and distributers of concrete bars report numerous small orders, making a sizable total. The Laclede Steel Co. has booked 375 tons for the St. Louis Municipal Courts Building and 115 tons for the Goldman Building, East St. Louis. Sheets are in fair demand, with specifications satisfactory. Plates, particularly tank, are slow. Wire goods of all sorts for use in the rural areas are moving in excellent volume. No price changes are reported.

Old Material.—Activity on the part of dealers continues to feature a stronger scrap market. Consuming industries in numerous cases need scrap but are vigorously resisting the upturn in prices. However, many have been forced to buy small lots at figures set by the middlemen. Yard stocks are not large, and little material is arriving from country shipping points. All varieties of steel are in demand, especially specialties. Heavy melting has been lifted to a minimum of $12.25, the highest point it has reached in several months. Miscellaneous rails and rails for rolling are also higher. A fair tonnage of offerings has come from the railroads as follows: Chicago & Alton, 1235 tons; Pullman Co., 150 tons; Union Pacific, 2500 tons; Missouri Pacific, 4000 tons; Burlington, 3900 tons; Chicago, Milwaukee & St. Paul, 6500 tons; Mobile & Ohio, 500 tons; Big Four, 3500 tons, and Nickel Plate, 600 tons.

Prices per gross ton f.o.b. dealers' yards and delivered St. Louis district consumers' works:

Heavy melting steel	$12.25 to $12.75
No. 1 locomotive tires	14.25 to 14.75
Heavy shoveling steel	12.25 to 12.75
Miscellaneous standard-section rails, including frogs, switches and guards, cut apart	14.75 to 15.25
Railroad springs	15.25 to 15.75
Bundled sheets	8.50 to 9.00
No. 2 railroad wrought	12.25 to 12.75
No. 1 busheling	10.25 to 10.75
Cast iron borings	9.25 to 9.75
Iron rails	12.50 to 13.00
Rails for rolling	15.50 to 16.00
Machine shop turnings	6.75 to 7.25
Steel car axles	19.00 to 19.50
Iron car axles	23.50 to 24.00
Wrought iron bars and transoms	20.00 to 20.50
No. 1 railroad wrought	11.00 to 11.50
Steel rails, less than 3 ft	15.50 to 16.00
Steel angle bars	12.75 to 13.25
Cast iron carwheels	13.50 to 14.00
No. 1 machinery cast	15.00 to 15.50
Railroad malleable	13.50 to 14.00
No. 1 railroad cast	14.50 to 15.00
Agricultural malleable	12.50 to 13.00
Relaying rails, 60 lb. and under	20.50 to 23.50
Relaying rails, 70 lb. and over	26.50 to 29.00

Cincinnati

Sanitary Company Buys 5000 Tons of Pig Iron—Scrap Firm

CINCINNATI, Aug. 30. — The pig iron market is firmer, with slightly heavier inquiry and some gain in buying. Inquiry covers lots of 100 tons, 250 tons and 500 tons for Indiana melters and 100 tons for central Ohio delivery. The Standard Sanitary Mfg. Co. is reported to have closed for around 5000 tons of Southern iron for fourth quarter delivery at Louisville. A central Ohio melter is reported to have placed 2000 tons with a Lake furnace. Some silvery, low phosphorus and ferrosilicon has been sold.

Prices per gross ton, delivered Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$20.39 to $20.89
So. Ohio malleable	20.14 to 20.89
Alabama fdy., sil. 1.75 to 2.25	20.94
Alabama fdy., sil. 2.25 to 2.75	21.44
Tennessee fdy., sil. 1.75 to 2.25	21.69
Southern Ohio silvery, 8 per cent	30.39

Freight rates: $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Coke.—Foundry coke in this district will remain at present prices through September unless coal prices again advance. In domestic grades by-product egg has advanced 50c. per ton at Cincinnati and Detroit and 25c. at Chicago. Portsmouth egg coke will advance $1 to $5.50, bringing it into line with Ashland and other makes. Foundry coke specifications are expanding. Domestic specifications are undergoing a seasonal advance. Coke demand from the automobile industry is lighter.

Foundry coke prices per net ton, delivered Cincinnati: By-product coke, $9.52 to $9.64; Wise County coke, $7.59 to $8.09; New River coke, $10.09 to $10.59. Freight rates: $2.14 from Ashland, Ky.; $2.59 from Wise County and New River ovens.

Old Material.—Prices are being maintained, with some buyers pressing to place contracts. Mills are not yet buying in volume, placing scattered orders and light specifications for immediate needs only.

Dealers' buying prices per gross ton f.o.b. cars, Cincinnati:

Heavy melting steel	$12.50 to $13.00
Scrap rails for melting	13.25 to 13.75
Loose sheet clippings	9.00 to 9.50
Champion bundled sheets	9.50 to 10.00
Cast iron borings	9.00 to 9.50
Machine shop turnings	8.00 to 8.50
No. 1 busheling	10.50 to 11.00
No. 2 busheling	7.50 to 8.00
Rails for rolling	14.00 to 14.50
No. 1 locomotive tires	14.25 to 14.75
No. 1 railroad wrought	12.00 to 12.50
Short rails	17.75 to 18.25
Cast iron carwheels	13.50 to 14.00
No. 1 machinery cast	17.50 to 18.50
No. 1 railroad cast	14.50 to 15.00
Burnt cast	8.50 to 9.00
Stove plate	10.50 to 11.00
Brake shoes	10.25 to 11.00
Railroad malleable	13.00 to 13.50
Agricultural malleable	12.50 to 13.00

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes	3.40c.
Bars, soft steel or iron	3.30c.
Reinforcing bars	3.30c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Open-hearth spring steel	4.75c. to 5.00c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue annealed sheets (No. 10)	3.60c.
Structural rivets	3.85c.
Small rivets	65 per cent off list
No. 9 annealed wire, per 100 lb	$3.00
Common wire nails, base per keg	2.95
Cement coated nails, base 100 lb. keg	2.95
Chain, per 100 lb	7.55
	Net per 100 Ft.
Lap-welded steel boiler tubes, 2-in	$18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in	19.00
4-in.	39.00

Birmingham

Pig Iron Quiet — Railroads Not Yet Interested in 1928 Rail Needs

BIRMINGHAM, Aug. 30.—Pig iron buying is from hand to mouth and, in the aggregate, falls short of current output. Production has been curtailed through the blowing out of a Sheffield, Ala., furnace of the Sloss-Sheffield Steel & Iron Co. The output of the new No. 2 City furnace, however, has now reached 390 tons per day, and, with three other stacks active, the total production of the Sloss company is between 1300 and 1500 tons daily. Nineteen blast furnaces in all are in operation in this district, of which 11 are producing foundry iron, six are on basic iron, and two on special grades, including ferromanganese. The Gulf States Steel Co. has its single furnace operating on foundry iron, and the Tennessee Coal, Iron & Railroad Co. also has one furnace making that grade. Makers of cast iron pressure pipe are operating at a slow pace, and other melters also are running on a curtailed basis. The smaller melters are buying pig iron for two weeks ahead at the most, and larger consumers are doing little better. Pig iron prices are unchanged.

Prices per gross ton, f.o.b. Birmingham district furnaces:

No. 2 foundry, 1.75 to 2.25 sil.	$17.25
No. 1 foundry, 2.25 to 2.75 sil.	17.75
Basic	17.25
Charcoal, warm blast	29.00

Rolled Steel.—Delay in the announcement of railroad requirements in steel for the coming year has had a depressing effect on market sentiment. Current business is confined to a few supplementary orders for rails for 1927 delivery, and to fairly active buying of cotton ties and some of the other light forms of finished steel.

The market in fabricated steel is quiet. Mill prices on finished steel are unchanged.

Cast Iron Pipe.—Demand for pressure pipe is slow, and prices are weak. Although $30 per net ton, Birmingham, is still generally quoted for 6-in. and larger diameters, recent bids in the Middle West brought out quotations of less than $29. Improvements to be undertaken at the plant of the McWane Cast Iron Pipe Co. in September are expected to be completed within six months, materially increasing productive capacity.

Coke.—Demand for coke shows improvement, and shipments are moving forward in steady volume. Early fall requirements are expected to be large. Coal production in Alabama has increased materially in the last two weeks, now totaling 400,000 tons weekly. Car loadings at the mines are improving, with considerable coal consigned to points outside this territory.

Old Material.—Market sentiment has improved, although current sales are at unchanged prices. Dealers are well supplied with scrap and are experiencing no difficulty in obtaining fresh stocks.

Prices per gross ton, delivered Birmingham district consumers' yards:

Heavy melting steel	$10.50 to $11.00
Scrap steel rails	12.50 to 13.00
Short shoveling turnings	8.50 to 9.00
Cast iron borings	8.50 to 9.00
Stove plate	13.00 to 14.00
Steel axles	16.00 to 17.00
Iron axles	16.00 to 17.00
No. 1 railroad wrought	11.00 to 12.00
Rails for rolling	13.00 to 14.00
No. 1 cast	14.00 to 15.00
Tramcar wheels	12.50 to 13.50
Cast iron carwheels	12.00 to 13.00
Cast iron borings, chemical	13.00 to 13.50

Toronto

Indian Government Places 8000 Tons of Rails — Pig Iron and Scrap Dull

TORONTO, ONT., Aug. 30.—Pig iron sales have shown some slight improvement during the past few days, although current business is almost entirely confined to orders for spot delivery and no advance buying was reported. There is a steady flow of orders against contract, which, together with spot orders, result in a good movement of foundry and malleable iron between producers and consumers. Blast furnace representatives have not opened their books for last quarter, but inquiries for that delivery are making their appearance in larger numbers. It is now believed that when books are opened there will be something of a rush on the part of melters and bookings will be as large if not larger than for previous quarters this year. While the production of pig iron fell off sharply during the months of June and July, the decline was almost entirely in basic iron and was due to the fact that a rail mill was down at Sault Ste. Marie, Ont., and another was running at a minimum rate at Sydney, N. S. The Soo mill started up on Aug. 1, and that at Sydney is operating at a higher rate. Foundry iron output in July showed a slight increase over the June figures. Following recent price reductions Canadian pig iron quotations now appear to be gaining some strength, although no further changes have as yet been made.

Prices per gross ton:

Delivered Toronto	
No. 1 foundry, sil. 2.25 to 2.75	$23.60
No. 2 foundry, sil. 1.75 to 2.25	23.60
Malleable	23.60
Delivered Montreal	
No. 1 foundry, sil. 2.25 to 2.75	26.00
No. 2 foundry, sil. 1.75 to 2.25	26.00
Malleable	26.00
Basic	25.00
Imported Iron at Montreal Warehouse	
Summerlee	33.50
Carron	33.00

Rails.—The placing of rail orders with Canadian mills is becoming a feature of the Canadian trade. Both the Algoma Steel Corporation, Sault Ste. Marie, Ont., and the Dominion Iron & Steel Corporation, Sydney, N. S., are now rolling rails for the Canadian Pacific Railway, and it is believed that other orders from that railroad and from the Canadian National Railways will be placed within the next few weeks. The Dominion Iron & Steel Corporation received an order during the week from the Indian Government for 8000 tons of rails, which, in addition to orders already on its books, assures continued rail mill operations for at least two months.

Old Material.—Despite the fact that most iron and steel markets of this country have gained in strength during the past two weeks, there has been no sign of improvement in scrap. The recent reduction in prices did not stimulate interest but, on the contrary, appears to have had a more demoralizing effect. Dealers in both Toronto and Montreal state that business as a whole is stagnant. Consumers are ordering only when in pressing need of supplies. No advance buying has been reported. In the Montreal market dealers report export business at a minimum. Inquiries from United States buyers are comparatively few. Prices in the Toronto market are firm at the new level, but something of a softening tendency is beginning to affect Montreal prices.

Dealers' buying prices:

	Toronto	Montreal
Per Gross Ton		
Heavy melting steel	$9.50	$9.00
Rails, scrap	10.00	10.00
No. 1 wrought	10.00	14.00
Machine shop turnings	7.00	7.50
Boiler plate	7.00	8.00
Heavy axle turnings	7.50	8.50
Cast borings	7.50	7.50
Steel turnings	7.00	8.00
Wrought pipe	5.00	6.00
Steel axles	14.00	17.00
Axles, wrought iron	16.00	19.00
Per Net Ton		
No. 1 machinery cast	15.00	18.00
Stove plate	9.00	13.00
Standard carwheels	13.00	16.00
Malleable scrap	13.00	14.00

Buffalo

Pig Iron Has Stronger Tone — 9300 Tons of Steel Placed for Station

BUFFALO, Aug. 30.—The pig iron market has stiffened, and it is doubtful if lower than $16.50, base furnace, is being quoted by any maker in this market. On No. 2 plain $17 is now being quoted for prompt and last quarter delivery. So far as is known, no first quarter iron is being sold or sought. No large inquiries are circulating, the last important one having been closed by the General Electric Co., which bought 1700 tons for two plants. A 500-ton order was placed during the week at $16.50, base. Malleable iron is being generally quoted at $17.

Prices per gross ton, f.o.b. furnace:

No. 2 plain fdy., sil. 1.75 to 2.25	$16.00 to $16.50
No. 2X foundry, sil. 2.25 to 2.75	16.50 to 17.00
No. 1X foundry, sil. 2.75 to 3.25	17.50
Malleable, sil. up to 2.25	16.50 to 17.00
Basic	16.50
Lake Superior charcoal	27.28

Finished Iron and Steel.—The market for bars, shapes and plates remains quiet, with 2.015c. per lb., Buffalo, quoted on bars in some cases. The fabricated steel market has been enlivened by the letting of 9300 tons for the new New York Central station in East Buffalo. Demand for sheets is fair, with prices firm and mill operations good. Warehouse business is making a good summer showing, having been notably satisfactory in the past two months. Considerable business has been done by the warehouses in reinforcing bars, structural steel and blue annealed sheets. Orders are as

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.75c.
Cold-finished flats, squares and hexagons	4.45c.
Rounds	3.95c.
Cold rolled strip steel	5.85c.
Black sheets (No. 24)	4.30c.
Galvanized sheets (No. 24)	5.15c.
Blue annealed sheets (No. 10)	3.80c.
Common wire nails, base per keg	$3.65
Black wire, base per 100 lb	3.90

numerous as a year ago. Warehouse prices on wire nails and reinforcing bars are a little weaker, but otherwise quotations are firm.

Old Material.—Little activity is occurring in this market, but there has been a slight softening of prices. There has been no sizable new business except in short rails for foundry purposes, which brought about $16.50. A small tonnage of knuckles and couplers was sold at $16.50. The mill that has been holding up its shipments continues to do so, and buying among dealers has quieted down, now being limited to very small lots.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$14.75 to $15.00
No. 2 heavy melting steel	14.00 to 14.25
Scrap rails	14.50 to 15.00
Hydraulic compressed sheets	12.25 to 12.50
Hand-bundled sheets	9.00 to 9.50
Drop forge flashings	11.50 to 12.00
No. 1 busheling	13.00 to 13.25
Heavy steel axle turnings	12.75 to 13.25
Machine shop turnings	9.25 to 9.50
Acid Open-Hearth Grades	
Railroad knuckles and couplers	15.75 to 16.25
Railroad coil and leaf springs	17.00 to 17.50
Rolled steel wheels	15.75 to 16.25
Low phosphorus billet and bloom ends	17.00 to 17.50
Electric Furnace Grades	
Heavy steel axle turnings	12.75 to 13.25
Short shoveling steel turnings	10.75 to 11.00
Blast Furnace Grades	
Short shoveling steel turnings	10.75 to 11.00
Short mixed borings and turnings	9.75 to 10.00
Cast iron borings	10.00 to 10.50
No. 2 busheling	9.00 to 9.50
Rolling Mill Grades	
Steel car axles	15.00 to 16.00
No. 1 railroad wrought	13.00 to 13.50
Cupola Grades	
No. 1 machinery cast	15.25 to 15.75
Stove plate	13.50 to 14.00
Locomotive grate bars	11.00 to 11.50
Steel rails, 3 ft. and under	16.50 to 17.00
Cast iron carwheels	14.00 to 14.50
Malleable Grades	
Railroad	15.00 to 15.50
Agricultural	15.00 to 15.50
Industrial	15.00 to 15.50

Youngstown

Less Than Half of Valley Sheet Mills in Operation — Pig Iron Firm

YOUNGSTOWN, Aug. 30.—Less than half of the 127 sheet mills in this district are in operation this week. The actual number of active units is 57, which compares with 89 last week. The dip in operations is sharper than in demand, and a good many more mills might be kept on if the owners had not decided to let orders accumulate sufficiently to provide a more economical operation another week. Sheet buying is dragging, and the betterment that has been looked for is still a hope.

Local makers of pipe are getting a very steady run of buttweld sizes, but lapwelded and seamless pipe still reflect in moderate sales the restriction of oil well drilling operations made necessary by the low prices resulting from overproduction. Pipe mill operations, based upon the number of active units, are above 70 per cent, but actual output is not that high, as some mills are running only single turn. Some of the production is going into stock. Mills find it necessary to carry larger warehouse assortments than formerly on account of the close-to-requirements character of the buying.

Bars and strips are still dull, reflecting the failure of the motor car industry to stage a recovery from the summer slump. Prices of these several products are holding well, but this condition is not remarkable in view of the fact that buyers are not exerting much pressure against the market and producers commonly believe that concessions would not stimulate buying.

Ingot production remains at around 60 per cent of capacity, with 32 out of 53 independent open-hearth furnaces making steel and 10 of the 15 Steel Corporation steel-making units engaged. Of the 29 steel works blast furnaces in the Mahoning and Shenango valleys, 16 are in production. Only three of the 11 merchant furnaces are producing, the Sharpsville Furnace Co., Sharpsville, Pa., having banked its furnace yesterday while the furnace of the Shenango Furnace Co., Sharpsville, also is banked for this week.

Outside of some purchases of foundry iron for fourth quarter by a Pittsburgh sanitary ware manufacturer, in which local producers shared, the pig iron market has been inactive. The purchase, however, served to demonstrate that foundry iron is firm at $17.50, Valley furnace, for No. 2 grade.

Scrap dealers are still asking more for the steel works grades than they can obtain, since local steel companies are not increasing ingot output and consequently do not have to buy scrap.

Boston

Consumer Demand Stiffens Scrap Market — Coke Prices Unchanged

BOSTON, Aug. 30.—Pig iron sales dropped to a new low level in the past week. The largest individual purchase reported was by a central Massachusetts foundry, which placed 500 tons of No. 2X with a furnace east of Buffalo. Otherwise transactions were confined largely to car lots. Buffalo iron is selling more often at $16.50 a ton, furnace, for No. 2 plain and at $17 for No. 2X, than at 50c. a ton less, and there is a tendency among furnaces east of Buffalo to quote prices 25c. to 50c. a ton higher than a fortnight ago. Iron from furnaces east of Buffalo has been sold in the past week on the old basis, however, and since two furnaces are piling iron and one is out of blast, the situation is not so firm as it appears on the surface. No inquiry of a formal nature is reported. Foundries are taking iron on schedule. An improved demand is anticipated following Labor Day, particularly from jobbing foundries, as they are figuring more actively on prospective business. Foundries working on specialty castings are fairly busy.

Prices of foundry iron per gross ton, delivered to most New England points:

Buffalo, sil. 1.75 to 2.25	$20.91 to $21.41
Buffalo, sil. 2.25 to 2.75	21.41 to 21.91
East. Penn., sil. 1.75 to 2.25	23.15 to 23.65
East. Penn., sil. 2.25 to 2.75	23.65 to 24.15
Virginia, sil 1.75 to 2.25	27.42
Virginia, sil. 2.25 to 2.75	27.92
Alabama, sil. 1.75 to 2.25	24.16 to 26.02
Alabama, sil. 2.25 to 2.75	24.66 to 26.52

Freight rates: $4.91 from Buffalo, $3.65 from eastern Pennsylvania, $5.92 from Virginia, $6.91 to $8.77 from Alabama.

Coke.—Contrary to predictions a week ago, the New England Coal & Coke Co. and the Providence Gas Co. announce that there will be no change in their prices on by-product foundry coke in September. They will remain at $12 a ton, delivered, within a $3.10 freight rate zone. Additional sales of Connellsville district foundry coke were made in the past week at delivered prices $1.50 a ton under those on New England fuel. Local brokers have been informed that Connellsville prices will be advanced Sept. 1.

Shapes and Plates.—The large steel mills are hold-

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars and small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	6.60c.
Norway, squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Round and hexagons	4.05c.
Squares and flats	4.55c.
Toe calk steel	6.00c.

ing firmly to 1.70c. per lb., base Pittsburgh, on shapes and to 1.80c. on plates. Some of the smaller mills have taken tonnages at slight concessions, but even they are now asking the above prices. Fabricators report that most current business consists of small tonnages, but aggregate bookings of several firms in the past week ran into several hundred tons each. Competition is still very keen, and low prices have been made on some jobs.

Cast Iron Pipe.—Newton, Mass., has awarded 200 tons of 6-in. pipe to R. D. Wood & Co., and Attleboro, Mass., has placed 200 tons of 6 and 8-in. pipe with the United States Cast Iron Pipe & Foundry Co. No other municipalities have openly placed business, but several have done so privately. Putnam, Conn., will close bids Sept. 8 for furnishing and laying 400 tons of pipe. Quotations made openly on domestic pipe follow: 6, 8, 10 and 12-in., $47.10 per net ton, delivered common Boston freight rate points; 16-in. and larger, $46.10. A differential of $4 a ton is asked on Class A and gas pipe. These prices, particularly on large pipe, are being shaded on round tonnages.

Old Material.—The appearance of a Harrisburg, Pa., steel mill in the market for round tonnages of bundled skeleton, steel turnings, cast iron borings, yard steel, stove plate and heavy breakable cast has put a somewhat different face on the old material situation. Prices have not weakened as was anticipated. On the contrary, some of them are higher. For instance, brokers that heretofore have paid $6.10 a ton, on cars shipping point, for long bundled skeleton, now offer $6.60, and they have raised their offers on steel turnings 35c. a ton to $6.60. Steel mill borings, at $7.10 a ton, represent an advance of 50c. a ton. Offers of $7.10 for yard steel represent no change. One broker wants a round tonnage of bundled cotton ties at $5.60 a ton, on cars, a reduction of 5c. from his previous bid. Special orders for chemical borings are being put through at $10.60 a ton, on cars, while $10.10 is about the best price offered on large quantities. Sales in the past week included several cars of odd grades of material, such as light scrap, at $4 to $5 a ton, on cars. Two consumers are offering $12.50 a ton, delivered, for specification pipe, or $7.60 a ton, on cars, here.

Buying prices per gross ton f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$9.50 to $10.00
Scrap rails	8.00 to 8.50
No. 1 railroad wrought	10.50 to 11.00
No. 1 yard wrought	8.50 to 9.00
Machine shop turnings	6.25 to 6.60
Cast iron borings (steel works and rolling mill)	6.50 to 7.10
Bundled skeleton, long	6.25 to 6.60
Forged flashings	6.50 to 7.00
Blast furnace borings and turnings	6.25 to 6.50
Forged scrap	6.00 to 6.50
Shafting	13.50 to 14.00
Street car axles	16.00 to 16.50
Wrought pipe (1 in. in diameter, over 2 ft. long)	7.00 to 7.60
Rails for rerolling	10.00 to 10.50
Cast iron borings, chemical	10.10 to 10.60

Prices per gross ton delivered consumers' yards:

Textile cast	$15.00 to $15.50
No. 1 machinery cast	14.50 to 15.00
No. 2 machinery cast	12.50 to 13.00
Stove plate	11.00 to 12.00
Railroad malleable	14.50 to 15.00

Hearing on Bethlehem Merger Case Set for Sept. 20.

WASHINGTON, Aug. 30.—Hearing before the board of review of the Federal Trade Commission in the Bethlehem Steel Co. merger case has been set for Sept. 20. The hearing will relate to proposed plans of the commission either to revise the old complaint and narrow the charges or to dismiss it entirely.

American Sheet & Tin Plate Co. Buys Four-High Cold-Rolled Mill

American Sheet & Tin Plate Co. bought a 4-high cold mill for installation at its Wood works, McKeesport, Pa., from E. W. Bliss Co. This mill has 16-in. center rolls and 34-in. backing-up rolls and is capable of rolling sheets up to 48 in. wide.

Detroit

Delay in Appearance of Ford Models Holds Up Steel Buying

DETROIT, Aug. 30.—A slight upturn in the demand for finished steel has developed in this territory in the past week or two, and while the volume of business in August has been disappointing, it shows a little gain over July. Some of the motor car builders have increased production this month and others have slowed down. The industry as a whole will start September with about the same production as on Aug. 1, and any change that develops during the month is expected to be toward increased output. Automobile manufacturers and parts makers are holding down specifications to early needs. The Chevrolet Motor Co., which is often the first motor car manufacturer to enter the market for future needs, has sent out an inquiry for a portion of its fourth quarter requirements in finished steel in various forms. It is the consensus of opinion in both the steel and automotive industries that motor car sales and production have been checked to considerable extent because the trade is waiting for the new models of the Ford Motor Co. At the present time it is regarded as doubtful whether the Ford company will get under production in a large way before October at the earliest. Information has reached some of the steel sales offices that the Ford company will come in the market the next few days for steel to manufacture 100,000 cars. However, this report is unconfirmed. The Ford company purchased steel a few weeks ago for the first lot of 10,000 cars, and it has bought practically no material since that time.

Steel Bars and Structural Material.—The market is holding fairly steady at 1.80c., Pittsburgh, for commercial steel bars. However, on billet steel reinforcing bars 1.75c., Pittsburgh, is being quoted. On rail steel reinforcing bars, quotations of 1.89c. and $38 per ton, delivered, or equivalent to 1.60c., Pittsburgh, are being named. Structural material is commonly quoted at 1.80c., Pittsburgh, but this is evidently being shaded for round lots. Bids on two jobs requiring 2200 tons have been rejected, and not much new inquiry is pending. The demand for cold-finished steel is more active than recently but there is little new business, as most of the orders are against old contracts. Large consumers are getting concessions of $2 a ton from the commonly quoted price of 2.30c., Pittsburgh.

Strip Steel.—A fair amount of business in hot-rolled strip has been placed by brake drum manufacturers at the ruling prices, from which there appears to be no deviation. Cold-rolled strip is not active, but mills are holding to 3.25c., Cleveland and Pittsburgh. Buyers in the automotive field have resorted to considerable pressure to break the present prices on fender stock of 4.75c. for No. 20 and 4.80c. for No. 22 gage, but apparently without success. When lower prices were prevailing on cold-rolled strip earlier in the year, fender stock was sold at as low as 4.40c.

Sheets.—Efforts are still being made by some of the automobile companies to secure concessions from ruling quotations. While base prices are being firmly maintained, it is commonly reported that buyers in some cases have succeeded in securing the waiving of certain extras. Automobile body plants are not very busy, and this is reflected in a rather limited demand for body sheets.

Alloy Steel.—The demand is slow, although orders have improved slightly in the past week or two. The market is in an extremely competitive condition, and while makers claim that recent reductions have brought prices very close to the cost of production, the minimum prices as quoted on our price page are being shaded $1 to $2 a ton in some cases for round lots of the more commonly used grades.

About 700 tons of steel have been placed in the gate of the Illinois waterway locks at Bell's Island, near Marseilles, Ill.

WEIRTON STEEL EXPANSION

Stripsheet Mills Practically Completed — Operations and Sales in Three Divisions

Remarkable success has attended the starting of the new stripsheet mill of the Weirton Steel Co., Weirton, W. Va., which in exactly seven days following the starting of the first slab through it has been brought up to rolling stripsheets 36 in. wide and of No. 16 gage. Only the hot mills are as yet in operation, the continuous pickling and cold-finishing departments still being uncompleted, but with the material already on the ground, it is expected that the entire mill will be ready for operation about Oct. 1. Starting with stripsheets 20 in. wide and of 0.125 gage, the mills have been steadily stepped up to what is regarded as the ultimate in width and gage for continuous hot mills, and getting to that stage so promptly is eloquent testimony of the careful preliminary engineering and investigation. However, the mill is gradually being brought up to its maximum rolling width of 48 in.

This installation is part of a plant expansion program worked out and directed by C. H. Hunt, chief engineer of the company, involving the expenditure of approximately $15,000,000 and which has been in progress for a little more than a year. In that time the company has built docks for the handling of its coal, all of which comes by river from its own mines located on the Monongahela River above Brownsville, Pa. Part of this dock is to be occupied by a warehouse to be utilized in the shipment of finished steel by the inland waterways routes. Included in the new construction also was a new 800-ton blast furnace, 46 by-product coke ovens, more than doubling its coke-making capacity, four 200-ton open hearth furnaces and the rebuilding to that capacity of one of its original 100-ton furnaces, bringing the steel working capacity up to 1,000,000 tons per year.

To accommodate this expansion of its productive facilities, the company has rearranged its activities into three general divisions of operations and of sales, each division being headed by a manager under the direction of a vice-president.

Direction of the sheet and tin plate mills of the company has been combined into one division, with James M. Hill, formerly superintendent of the sheet mills, as manager. Frank E. Flynn, for several years superintendent of the strip mill, now becomes manager in charge of both the strip mills and the new stripsheet mill. The other operating division, embracing the supervision of the river docks, coke plant, blast furnaces, open-hearth furnaces and blooming, billet and sheet bar mills, will be under the direction of E. J. Anglin. J C. Williams, vice-president and general manager, who remains the general operating head of the company, will have as his assistant, with the title of assistant general manager, George W. Vreeland, who has resigned his position as assistant superintendent of the Mingo and Bellaire works of the Carnegie Steel Co.

The three general sales divisions are sheet and tin plate, headed by John J. Watson; strip steel, with Harry C. Smith as sales manager, and stripsheets, with Joseph P. Savage in charge. L. D. Brueckel is assistant manager of sales of the strip steel division and William M. McFate is assistant manager of sales stripsheet division. H. D. Westfall continues as vice-president in general charge of sales.

THE NEW WAGE DOCTRINE

Importance of Stable Wage Level to Prosperity Pointed Out

THE changed attitude of management toward wages was the subject of an article by F. C. Biggert, Jr., president United Engineering & Foundry Co., Pittsburgh, in the August issue of *United Effort*, the company's house organ. His remarks were in part as follows:

"Not many years ago there were many industrial managers who actually thought that railroads, structural plants, textile mills, canneries and machine shops were the consumers of steel, lumber, cotton and other products which they buy. On this assumption they argued that by cutting wages they could sell more cheaply and consequently stimulate business in dull times. The reasoning was good, but like a lot of our reasoning it was worthless because it was based upon a wrong foundation. Today the real up-and-doing managers of industry understand that neither railroads nor textile mills nor any other industry is a consumer. They know that only people, human beings, are real consumers and that by far the majority of these are wage earners, and that when wages come down the ability of this great majority of the people to consume also comes down and so business gets worse. So these managers make every effort to avoid reducing wages.

"Now the question will naturally arise, 'If it is good to keep wages up, why not raise them still higher?' We might tritely answer this by saying that a little being good is not proof that more will be better, but fortunately we may answer more definitely.

"The fact is that neither high wages nor low wages are important, but *unchanging wages*. We have seen the bad effect of reducing wages, but increasing them also has its disadvantages, which are quite as harmful. Of course, increasing wages means increasing prices, so that in the end there is no change in the real return for the day's work. But it is not possible to increase all wages at one time, and those who get an early increase have a temporary benefit at the expense of those who receive their increase later. This causes dissatisfaction and industrial disturbances which seriously interfere with the general good of the country.

"Then there are disturbances in the financial system when wages increase. More money is needed to do business, credits must be extended, people become nervous and begin to economize. Finally a condition very similar to that caused by reducing wages develops and a period of poor times ensues.

"So we are forced to conclude, as previously stated, that *an unchanging wage level* is the most satisfactory condition possible, and the fact that this is now understood by a large majority of our industrial managers, and a good proportion of our wage earners, is fortunate for all concerned."

No Decision Yet on Complaint of Foreign Steel Dumping

WASHINGTON, Aug. 30.—Present indications are that a comparatively early decision will be made by the Treasury Department regarding the complaint of American steel manufacturers against alleged dumping of imported steel, especially from Germany. The domestic makers are asking for the application of the anti-dumping act. The case has been delayed somewhat since the recent hearing in Washington by reason of a request made by the Treasury Department for additional information from the Anti-Dumping Unit in New York, which is in course of preparation.

Gas Associations Merge

Amalgamation of the Natural Gas Association of America into the American Gas Association was completed Aug. 1, according to a statement of the latter. The Natural Gas Association will hereafter be known as the Natural Gas Department of the American Gas Association. All members of the Natural Gas Association in good standing become automatically members of the American Gas Association. The annual meeting of the Natural Gas men will coincide with the annual convention of the American Gas Association. The Natural Gas men may, however, hold additional meetings.

NON-FERROUS METAL MARKETS

The Week's Prices

Cents per Pound for Early Delivery

	Aug. 30	Aug. 29	Aug. 27	Aug. 26	Aug. 25	Aug. 24
Lake copper, N. Y.	13.25	13.25	13.25	13.25	13.25	13.25
Electrolytic copper, N. Y.*	13.00	12.87½	12.87½	12.87½	12.87½	12.87½
Straits tin, spot, N. Y.	63.50	63.62½	....	63.50	63.62½	64.25
Lead, New York	6.60	6.60	6.55	6.55	6.55	6.60
Lead, St. Louis	6.30	6.30	6.30	6.30	6.30	6.30
Zinc, New York	6.60	6.62½	6.60	6.60	6.62½	6.65
Zinc, St. Louis	6.25	6.27½	6.25	6.25	6.27½	6.30

*Refinery quotation; delivered price ¼c. higher.

NEW YORK, Aug. 30.—None of the markets is particularly active. Prices of copper are firmer and inquiry is brisker. Moderate activity has prevailed in tin with prices only slightly lower. Quotations for lead have been reduced in a quiet market. There has been very little life in the zinc market with quotations at lower levels.

Copper.—Electrolytic copper, which was available a week ago at 13.12½c. or lower, delivered in the Connecticut Valley, has apparently all been absorbed by the very moderate demand which has prevailed in the last week. This lower priced copper was available from one or two sources, other producers quoting not less than 13.25c., delivered. As a result of this and also because of more active inquiry yesterday and today, the market is on a 13.25c., delivered, basis and the general tone is stronger. A contributing factor to the strength has been larger foreign sales, particularly to Germany. The quotation of Copper Exporters, Inc., was lower on Wednesday, Aug. 24, from 13.65c. to 13.50c., c.i.f. Hamburg. It is stated that consumers must still buy considerable October metal as well as some for September delivery. Lake copper is quoted at 13.25c., delivered.

Tin.—During the early part of the last calendar week the market was sluggish with about 200 tons sold on each day, Aug. 22, 23 and 24. On Friday, Aug. 26, the market became quite active and 500 tons changed hands, consumers and dealers participating. Thus the sales for the week ended Saturday were about 1100 tons. Yesterday, Monday, the market was very quiet, not over 150 tons being sold. There is evidently a disposition to mark time until the statistics for August appear. It is expected that the world's visible supply will show a decrease of 1000 to 1500 tons, this fact being taken into consideration by market observers. Stocks at London are about 1600 tons and those at New York have increased and both hang heavily over the market. September shipments from the East are estimated at 6500 tons. Since August shipments were light, it is probable that those for September and October will be heavy because of increased production. The market today has been moderately active with spot Straits tin quoted at 63.50c., New York. London prices today were but slightly changed from those of a week ago with spot standard quoted at £289 2s. 6d., future standard at £285 and spot Straits at £292 12s. 6d. The Singapore price was £288 15s. Arrivals thus far this month have been 7237 tons with 6043 tons reported afloat.

Lead.—This market is quiet but fairly steady. The leading interest on Aug. 24 reduced its official quotation from 6.75c. to 6.60c., New York, which is its contract price. This reduction was a readjustment to the outside market which was already at about that level. The outside market then gave way about five points but has recovered to 6.60c., so that now both markets are practically equal. The quotation at St. Louis is 6.30c. Demand is slow, due to heavy buying in recent weeks.

Zinc.—A fair business is reported from consumers and prices have remained within an unusually narrow range, though they are a little lower than a week ago. Prime Western is quoted at 6.25c., St. Louis, or 6.60c., New York. Statistics for the first half of August for the second time indicate a reduction in stocks, the decline for the first half being about 1000 tons.

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	65.00c. to 66.00c.
Tin, bar	67.00c. to 68.00c.
Copper, Lake	14.62½c.
Copper, electrolytic	14.37½c.
Copper, casting	13.87½c.
Zinc, slab	7.75c. to 8.75c.
Lead, American pig	7.85c. to 8.85c.
Lead, bar	10.00c. to 11.00c.
Antimony, Asiatic	12.50c. to 13.50c.
Aluminum No. 1 ingot for remelting (guaranteed over 99 per cent pure)	27.00c. to 28.00c.
Aluminum ingots, No. 12 alloy	26.00c. to 27.00c.
Babbitt metal, commercial grade	30.00c. to 40.00c.
Solder, ½ and ½	41.50c. to 42.50c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	67.50c.
Tin, bar	69.50c.
Copper, Lake	14.00c.
Copper, electrolytic	14.00c.
Copper, casting	13.25c.
Zinc slab	7.75c.
Lead, American pig	7.50c.
Antimony, Asiatic	18.00c.
Lead, bar	9.50c.
Babbitt metal, medium grade	21.75c.
Babbitt metal, high grade	73.25c.
Solder, ½ and ½	39.25c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	18.25c. to 19.00c.
Copper, hot rolled	22.00c. to 23.00c.
Copper, cold rolled, 14 oz. and heavier	24.25c. to 25.25c.
Seamless Tubes—	
Brass	23.12½c. to 24.12½c.
Copper	24.00c. to 25.00c.
Brazed Brass Tubes	26.25c. to 27.25c.
Brass Rods	16.00c. to 17.00c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	10.50c. to 11.00c.
Zinc sheets, open	11.00c. to 11.25c.

Non-Ferrous Rolled Products

Mill prices on bronze, brass and copper products have not changed since Aug. 3. Zinc sheet and lead full sheets are still quoted at the advances of Aug. 5 and July 30 respectively.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	18.25c.
Copper, hot rolled	22.00c.
Zinc	10.00c.
Lead (full sheets)	10.25c. to 10.50c.
Seamless Tubes—	
High brass	23.12½c.
Copper	24.00c.
Rods—	
High brass	16.00c.
Naval brass	18.75c.
Wire—	
Copper	15.25c.
High brass	18.75c.
Copper in Rolls	21.00c.
Brazed Brass Tubing	26.25c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of the Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	35.50c.
Tubes, base	45.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

	Base per Lb.
Sheets—	
High brass	19.25c.
Copper, hot rolled	22.00c.
Copper, cold rolled, 14 oz. and heavier	24.25c.
Zinc	11.00c.
Lead, wide	10.25c.
Seamless Tubes—	
Brass	24.62½c.
Copper	25.50c.
Brazed Brass Tubes	28.50c.
Brass Rods	16.00c.

Antimony.—Chinese metal for all positions is considerably firmer at 12c., New York, duty paid, due partly to more activity on the part of dealers.

Nickel.—Wholesale lots of ingot nickel are quoted at 35c., with shot nickel at 36c. and electrolytic nickel at 39c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 26c. per lb., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, Aug. 30.—Sales in this market are small and widely scattered. Prices, with the exception of copper and antimony, are lower. Old metals are quiet and prices are nominal.

Prices, per lb., in carload lots: Lake copper, 13.35c.; tin, 65c.; lead, 6.30c.; zinc, 6.30c.; in less-than-carload lots, antimony, 13.50c. On old metals we quote copper wire, crucible shapes and copper clips, 10c.; copper bottoms, 9c.; red brass, 9c.; yellow brass, 6.75c.; lead pipe, 5c.; zinc, 3.50c.; pewter, No. 1, 34c.; tin foil, 43.50c.; block tin, 52c.; aluminum, 13.25c.; all being dealers' prices for less-than-carload lots.

Old Metals, Per Lb., New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators and the selling prices are those charged consumers after the metal has been properly prepared for their use.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	11.25c.	12.75c.
Copper, heavy and wire	11.00c.	12.00c.
Copper, light and bottoms	9.50c.	10.50c.
Brass, heavy	7.00c.	8.50c.
Brass, light	5.50c.	7.25c.
Heavy machine composition	8.75c.	10.125c.
No. 1 yellow brass turnings	7.75c.	8.25c.
No. 1 red brass or composition turnings	8.00c.	9.00c.
Lead, heavy	5.25c.	5.75c.
Lead, tea	4.50c.	5.00c.
Zinc	4.00c.	4.50c.
Sheet aluminum	13.50c.	15.50c.
Cast aluminum	13.50c.	15.50c.

FABRICATED STRUCTURAL STEEL

Awards Total Nearly 50,000 Tons, While Projects Up For Bids Reach 47,000 Tons

Structural steel lettings continue as the outstanding items in the steel market in point of tonnage. The week's awards total nearly 50,000 tons, of which 12,000 tons is for a Detroit department store, 9300 tons for a New York Central Railroad station in Buffalo and 7000 tons for a hotel in Chicago. New York subway work accounts for nearly 28,000 tons of the 47,000 tons of work up for bids. Subway construction will take close to 16,000 tons, while 12,000 tons is estimated for a subway repair shop. Awards follow:

WILMINGTON, DEL., 500 tons, passenger car shop for Pennsylvania Railroad, to Belmont Iron Works.

CLEVELAND, 100 tons, store building for Utility Chevrolet Sales Co., to Fort Pitt Bridge Works.

ST. LOUIS SOUTHWESTERN, 200 tons, riveted truss span, to an unnamed bidder.

THOMASTON, ME., 700 tons, cement plant, to New England Structural Co.

HUNTINGTON, MASS., 300 tons, State highway bridge, to Boston Bridge Works, Inc.

BOSTON, 185 tons, Temple Israel school, to C. S. Cunningham & Sons.

BOSTON, 300 tons, Jewish temple, to Boston Bridge Works, Inc.

BOSTON, 440 tons, Hyde Park school, to A. L. Smith Iron Works.

NEW YORK, 800 tons, apartment building on East Eighty-sixth Street, to Harris Structural Steel Co.

NEW YORK, 400 tons, St. Stephen's Catholic Church, to A. E. Norton, Inc.

NEW YORK, 250 tons, addition to plant of F. H. Bennett Biscuit Co., to Harris Structural Steel Co.

STATE OF NEW JERSEY, 600 tons, highway bridge, to Fort Pitt Bridge Co.

PHILADELPHIA, 1000 tons, manufacturing building for General Electric Co., to American Bridge Co.

PHILADELPHIA, 1100 tons, Manufacturers Exchange Building, to an unnamed fabricator.

PHILADELPHIA, 700 tons, chemical laboratory for University of Pennsylvania, to Shoemaker Bridge Co.

PHILADELPHIA, 650 tons, Jewish Synagogue, to McClintic-Marshall Co.

HOPEWELL, VA., 900 tons, plant for the Atmospheric Nitrogen Co., to an unnamed fabricator.

BALTIMORE & OHIO RAILROAD, 400 tons, bridges, to McClintic-Marshall Co.

SOUTHERN RAILWAY, 900 tons, four bridges, to unnamed fabricators.

LEHIGH VALLEY RAILROAD, 1000 tons, bridge at Newark, N. J., to Bethlehem Steel Co.

READING, PA., 450 tons, Y. M. C. A. building, to Bethlehem Steel Co.

DEXTER, N. Y., 300 tons, building for Dexter Sulphite Pulp & Paper Co., to James McKinney & Sons, Albany, N. Y.

MILFORD, MICH., 150 tons, General Motors garage, to the Massillon Bridge & Structural Co.

ST. LOUIS, 900 tons, building for Ward Baking Co., to Lehigh Structural Steel Co.

BUFFALO, 9300 tons, New York Central Railroad station, to Bethlehem Steel Co.

DETROIT, 12,000 tons, addition to J. L. Hudson store, to American Bridge Co.

EVANSVILLE, IND., 175 tons, tow boat for E. T. Slider Co., to Midland Barge Co.

BALTIMORE, 900 tons, two 80,000-bbl. oil tanks for American Oil Co., to Riter-Conley Co.

HAMILTON, OHIO, 500 tons, Koppers By-Product coke plant, to Pittsburgh Bridge & Iron Co.

CHICAGO, 7000 tons, Bryn Mawr Beach Hotel, to American Bridge Co.

CHICAGO, 700 tons, *Chicago Evening Post* Building, to American Bridge Co.

CHICAGO, 1580 tons, office building for De Paul University, to American Bridge Co.

DENVER & RIO GRANDE WESTERN, 500 tons, bridges, to American Bridge Co.

BOISE, IDAHO, 182 tons, Payette River bridge, to Virginia Bridge & Iron Co.

OAKLAND, CAL., 325 tons, Mutual Stores Building, to Dyer Brothers.

SAN FRANCISCO, 150 tons, apartment building on Van Ness Avenue, to Central Iron Works.

LOS ANGELES, 2700 tons, Earle C. Anthony Building, Tenth and Hope Streets, to Llewellyn Iron Works.

SAN DIEGO, 100 tons, 250,000-gal. tank and tower, to Chicago Bridge & Iron Works.

COLOMBIA, S. A., 600 tons, six barges for International Petroleum Co., to Dravo Contracting Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

EDDYSTONE, PA., 2000 tons, office building for Baldwin Locomotive Works, previously reported; general contract let to Turner Construction Co.

CORNING, N. Y., 400 tons, hotel.

PHILADELPHIA, 1000 tons, building for N. W. Ayer & Son.

LANSDOWNE, PA., 400 tons, high school.

CLEVELAND, 2000 tons, Eagle Avenue bridge for Cleveland Union Terminals Co.

CLEVELAND, 500 tons, Broadway bridge, for Cleveland Union Terminals Co.

BOSTON, 150 tons, public school.

LOWELL, MASS., 200 tons, Boston & Maine Railroad bridge.

PROVIDENCE, R. I., 700 tons, Loew's Theater.

HARTFORD, CONN., 225 tons, St. Thomas Seminary.

NEW YORK, 8900 tons, Nassau Street subway extension to be readvertised, bids closing Sept. 23.

NEW YORK, 6800 tons, subway route 109, section I, known as the Jay Street route; bids close Sept. 2.

NEW YORK, 12,000 tons, subway repair shops on 207th Street for the New York Board of Transportation; bids close probably on Sept. 30.

BROOKLYN, 600 tons, St. John's Hospital.

NEW YORK STATE, 800 tons, five highway bridges.

AMSTERDAM, N. Y., 250 tons, First National Bank.

TRENTON, N. J., 3000 tons, Trenton-Morrisville bridge over the Delaware River.

PENNSYLVANIA RAILROAD, 325 tons, four bridges.

PITTSBURGH, 800 tons, motion picture theater.

BEAUMONT, TEX., 500 tons, power house; Stone & Webster, general contractors.

FLINT, MICH., 1000 tons, Chevrolet Motor Co., plant addition; bids received and rejected, new bids to be taken later.

JACKSON, MICH., 1200 tons, Elks' Temple; bids rejected.

DETROIT, 350 tons, Michigan Central Railroad, Joseph Campau Street subway.

DETROIT, 300 tons, Grand Trunk Railroad, Joseph Campau Street subway.

ST. CHARLES, MICH., 200 tons, Michigan Central Railroad bridge.

TOLEDO, OHIO, 1800 tons, building for Libbey-Owens Glass Co.; Rochester Bridge Co., Rochester, Ind., low bidder.

CHILLICOTHE, MO., 350 tons, bridge for Chicago, Milwaukee & St. Paul.

DAVIS JUNCTION, ILL., 350 tons, bridge for Chicago, Milwaukee & St. Paul.

HOUSTON, TEX., 500 tons, lift bridge.

MILWAUKEE, 800 tons, Cedar-Biddle Street bascule bridge; Milwaukee Bridge Co., low bidder on steel at $148,795.

SAN PEDRO, CAL., 460 tons, transit shed.

LOS ANGELES, 1200 tons, Foreman & Clark Building, Seventh and Hill Streets; bids being taken.

LOS ANGELES, 250 tons, galvanized structural steel for the city; Minneapolis Steel & Machinery Co., low bidder.

OLYMPIA, WASH., 270 tons, two 200-ft. spans over Yakima River; bids opened.

MODESTO, CAL., 150 tons, transmission line for Modesto Irrigation District; bids Sept. 1.

EUREKA, CAL., 140 tons, County Hospital; bids opened.

SAN FRANCISCO, 800 tons, Y. M. C. A. hotel; Judson Mfg. Co., low bidder.

SAN FRANCISCO, 120 tons, apartment building on Ellis Street; bids being taken.

SAN FRANCISCO, 120 tons, Physicians' Building; Western Iron Works, low bidder.

No Change in Tonnage Rates of Sheet Mill Workers

YOUNGSTOWN, Aug. 30.—Tonnage rates for sheet and tin mill workers in Mid-Western mills continue for September-October at 25½ per cent above base, as result of the bi-monthly examination of sales sheets, conducted today. It revealed an average selling price of 3c. per lb. on Nos. 26, 27 and 28 gage black sheets shipped during the 60 days ended Aug. 20, or no change from the average of two months ago. The settlement was conducted 10 days earlier than usual, because of a change in the rules, taking all sales for the 60 days ended with the 20th of the month instead of to the end of the month as heretofore. The change will result in settlements going into effect on the first of every other month.

Industrial Finance

Stockholders of the United Engineering & Foundry Co., Pittsburgh, will be asked at the annual meeting on Oct. 28, next, to approve of a change in the capital structure, whereby present common stock of $100 par value will be replaced by no-par value shares and the number of shares increased six times. The company has outstanding 69,353 shares of common stock and 15,749 shares of preferred stock, of which 5647 shares of the former and 2251 shares of the latter are held in the company's treasury. It is planned to retire the treasury stock.

The Inland Wire & Cable Co., Sycamore, Ill., an outgrowth of the recent consolidation of the Chicago Insulated Wire & Mfg. Co. and the Illinois Wire & Cable Co., showed for the five months ended May 31, a consolidated net income of $223,544, after interest, federal taxes, depreciation and all other charges, equal to $2.01 a share earned on 105,000 shares of $10 par stock outstanding. For the year ended Dec. 31 last, net of the companies entering into the consolidation was $430,163, equivalent to $4.09 a share, as compared with $211,399, or $2.01 a share, in 1925. The current assets of the consolidated companies as of May 31 last totaled $1,991,822 and current liabilities, $924,264.

The Standard Laboratories, Inc., 847 West Jackson Boulevard, Chicago, has filed a voluntary petition in bankruptcy in the United States District Court, listing liabilities of $602,939 and assets of $75,173. Edwin D. Buell has been appointed receiver by Federal Judge Adam C. Cliffe.

REINFORCING STEEL

Week's Awards Total About 2750 Tons, While New Projects Amount to 3350 Tons

Made up of small jobs, the week's awards of concrete reinforcing steel amounted to about 2750 tons. New projects up for bids total close to 3350 tons. Awards follow:

HARTFORD, CONN., 100 tons, business building, to Truscon Steel Co.

MIDDLETOWN, CONN., 125 tons, Y. M. C. A., to Truscon Steel Co.

ELIZABETH, N. J., 170 tons, Chamber of Commerce Building, to Fireproof Products Co.

CHICAGO, 275 tons, Roosevelt Road viaduct, to Kalman Steel Co.

CHICAGO, 500 tons, rail and billet steel bars, Milliners' Building, to an unnamed bidder.

CHICAGO, 300 tons of rail steel, first two floors of the *Chicago Evening Post* Building, to Inland Steel Co.

CHICAGO, 118 tons, footings for Chicago River bridges, to Concrete Steel Co.

CHICAGO, 150 tons of rail steel, apartment building at 5501 West Washington Boulevard, to Joseph T. Ryerson & Son.

ST. LOUIS, 375 tons, Municipal Courts building, to Laclede Steel Co.

EAST ST. LOUIS, ILL., 115 tons, Goldman Building, to Laclede Steel Co.

LOS ANGELES, 314 tons, Fourth Street bridge, to an unnamed company.

PASADENA, CAL., 100 tons, warehouse, to an unnamed company.

SAN FRANCISCO, 100 tons, hospital on Bush Street, to San Francisco jobber.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

NEW YORK, 500 tons, loft building on East Forty-seventh Street; Frank S. Parker, architect.

CLEVELAND, 110 tons, Rocky River bridge.

HAMMOND, IND., tonnage not stated, first unit of a power plant for the State Line Generating Co.

POWERTON, ILL., 100 tons, foundation for power house; Foundation Co., general contractor.

CHICAGO, 165 tons, public school at Crawford Avenue and Washington Boulevard; McLennan Construction Co., general contractor.

CHICAGO, 165 tons, public school at Eighty-first Street and Federal Place; Hanson Brothers, low bidder.

CHICAGO, 100 tons, public school for crippled children at Washington Boulevard and Ashland Avenue; Harvey Hanson, low bidder.

CHICAGO, 560 tons, Manly Jr. High School; Machuda Brothers, low bidders.

COOK COUNTY, ILL., 500 tons, road work.

REDLANDS, CAL., 140 tons, road work; bids Sept. 19.

Railroad Equipment

The Lehigh Valley has ordered one gas-electric motor car and a trailer from the American Car & Foundry Co.

The Chicago, South Shore & Atlantic is inquiring for four caboose cars.

The Shell Oil Co. is in the market for 25 tank cars.

The Peruvian Government Railways have ordered three Mikado type locomotives, two from the Baldwin Locomotive Works and one from the American Locomotive Co.

The Erie has ordered two 100-ton oil-electric locomotives from the Ingersoll-Rand Co., General Electric Co. and American Locomotive Co.

The Great Northern has ordered six electric locomotives from the Westinghouse Electric & Mfg. Co.

The Anglo-Chilean Nitrate Co. has ordered 100 flat and 40 gondola cars from the American Car & Foundry Co.

The Armstrong Cork Co. has placed seven tank cars with the American Car & Foundry Co.

The Belt Line Railway of Chicago has ordered five locomotives from the Baldwin Locomotive Works.

The Detroit & Toledo Shore Line is in the market for four 8-wheel switching locomotives.

PERSONAL

John Follansbee has been elected president Follansbee Brothers Co., Pittsburgh, succeeding his brother, William U. Follansbee, who has been made chairman. The new president has been identified with this company, founded by his older brothers, since its organization 30 years ago. He served in the shipping department, the invoicing department and, after a period of 15 years as a traveling salesman, he was made general manager of sales. Later he became vice-president. For some time he has been president of the Sheet Metal Specialty Co. and the Lustro Coated Sheet Co., subsidiary Follansbee companies, and he will continue to hold these offices. He has been succeeded as general manager of sales by Charles A. Wilson, who also has been identified with the company since its organization. Mr. Wilson for a number of years had charge of purchases and more recently has been manager of mill service. He also will be assistant to the president. R. B. Perry, who has been assistant manager of mill service, is Mr. Wilson's successor in that position. The complete personnel of the company is now as follows: William U. Follansbee, chairman; John Follansbee, president; R. C. Kirk, vice-president and treasurer; B. G. Follansbee, vice-president; William D. Reid, secretary and auditor; Charles A. Wilson, assistant to prsident and general manager of sales; Edgar Masters, assistant auditor; D. S. Gaston, manager of jobbing department; R. B. Perry, manager of mill service; George R. Kerr, manager of sheet steel sales; J. C. Kilroy, manager of sales tin mill products; A. J. McFarland, general manager Follansbee, W. Va., plant; Gilbert Follansbee, general manager Toronto, Ohio, plant, and Louis A. Diller, secretary and general manager Sheet Metal Specialty Co.

JOHN FOLLANSBEE

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M. J. Myers, who has been in the general sales department of Columbia Steel Co., Pittsburgh, has been appointed assistant to the vice-president Superior Steel Corporation, Pittsburgh, effective Sept. 1. He was identified with the Republic Iron & Steel Co., Youngstown, for two years and with the Trumbull Steel Co., Warren, Ohio, for 10 years before going with the Columbia company about a year ago.

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Norman F. Melville has been appointed manager of metallurgy and inspection for the Superior Steel Corporation, Pittsburgh, effective Sept. 1. He was with the Columbia Steel Co., Elyria, Ohio, and Butler, Pa., in a like capacity for four years. He was graduated from Carnegie Institute of Technology, Pittsburgh, in 1921, and for two years was with the Carnegie Steel Co., at its Homestead works.

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S. B. Shutts, recently associated with the Thomas Furnace Co., Milwaukee, has severed that connection and is at present located at the Shorecrest Hotel, Milwaukee.

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W. J. Henry, owner of the Henry Forge & Tool Co., and president of Crouse & Pope Foundry Corporation, both of Auburn, N. Y., has purchased the controlling interest in the Oswego Tool Co., Oswego, N. Y., and will be president and treasurer of the company. William M. Henry will be vice-president; George H. Cleaver, secretary; P. A. Henry, assistant secretary, and E. W. Fulton, who has been acting works manager of the local company for several years, will be sales manager.

—

C. G. Ernst has been appointed manager of the new sales office recently opened in the Utica Gas & Electric Building, Utica, N. Y., by the Pittsburgh Coal Company, Pittsburgh, and will represent the company in central and eastern New York State.

—

Lars G. Nilson has resigned as chief engineer of the Nilson-Miller Corporation, Hoboken, N. J., to enter independent consulting engineering practice with offices at 1219 Garden Street, Hoboken. He has been active in the Nilson-Miller Corporation for 18 years and will continue to serve that company as a consultant, retaining his interests as a director and stockholder. In consulting practice he will devote himself to the design and development of special machinery and devices.

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Edward S. Gram was elected vice-president, John M. Smith, treasurer, and Henry W. Crosby, assistant treasurer of the Crosby Co., Buffalo, maker of sheet metal stampings, at the annual directors' meeting held recently.

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Harold L. Brown has been appointed manager of the Detroit Railway & Harbor Terminals Co., 4461 West Jefferson Avenue, Detroit, division of the Terminals & Transportation Corporation of America.

—

Thomas S. Poole has been appointed direct factory representative in the Southern territory of the Whitman-Barnes-Detroit Corporation, Detroit, effective Sept. 1, succeeding Frederick A. Hardin, resigned. Prior to the merger of the Whitman-Barnes Mfg. Co., and the Detroit Twist Drill Co. last September, Mr. Poole was associated for several years with the Detroit company. M. B. Snow, vice-president and a director of the corporation, has resigned and is succeeded by Karl Kendig, who is now vice-president and treasurer. H. Z. Callender, sales manager, has been appointed secretary and sales manager.

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George W. Vreeland has resigned as assistant superintendent of the Mingo and Bellaire, Ohio, works of the Carnegie Steel Co. to become assistant to J. C. Williams, vice-president and general manager Weirton Steel Co., Weirton, W. Va., with the title of assistant general manager of operations. Mr. Vreeland, who joined the Carnegie Steel Co. in 1901, was previously for three years with the Cambria Steel Co., Johnstown, Pa. His first position with the Carnegie Steel Co. was master mechanic blast furnace department, Duquesne, Pa., works. In 1904 he was promoted to assistant superintendent of that department and in 1908, was appointed superintendent of the Mingo, Bellaire and Steubenville furnaces of the company with headquarters at Mingo. A little more than a year ago he was advanced to the position he has just relinquished. He was born at Passaic, N. J. and was graduated from Cornell University as a mechanical engineer in 1898.

G. W. VREELAND

—

Russell T. Horn has been appointed superintendent of sheet mills for the Weirton company, succeeding James M. Hill, who has been made manager of the sheet and tin plate mill division.

—

John A. Topping, chairman Republic Iron & Steel Co., has returned to New York from England and Scotland, where he spent several weeks.

Neal W. Foster, Fitchburg, Mass., formerly associated with the National Acme Co., Cleveland, has been made clerk, treasurer and a director of the F. A. Whitney Carriage Co., Leominster, Mass.

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Henry D. Sharpe, president and treasurer Brown & Sharpe Mfg. Co., Providence, R. I., Clarence E. Whitney, president Whitney Mfg. Co., Hartford, Conn., and Willis F. Hobbs, president Bridgeport Hardware Mfg. Co., Bridgeport, Conn., have accepted invitations to serve on a committee of 100 of the National Association of Manufacturers to frame a "Platform of American Industry" to be submitted to the Republican and Democratic parties at their conventions next year. The first meeting of the committee will be held in New York in September.

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John K. Furst, formerly vice-president and chief engineer Pennsylvania Engineering Works, New Castle, Pa., effective Sept. 1, becomes general manager of the S. R. Smythe Co., Oliver Building, Pittsburgh. Mr. Furst in his new connection continues in the same kind of work he has been doing for some time, as the Smythe company, in addition to a general engineering business, specializes in open-hearth and heating furnaces, soaking pits, hot metal mixers, bessemer converters, duplex steel plants, blast furnaces and steel plant equipment.

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J. C. Miller, manager of the Ashland, Ky., plant, American Rolling Mill Co.; John B. Tytus, who has been responsible for many of the patents on the company's new sheet rolling mill at Ashland, and D. Eppelsheimer, consulting engineer for the Armco organization, have been appointed vice-presidents of the company.

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Jack Whiting, recently in charge of blast furnace operations for the Donner Steel Co., Inc., Buffalo, is now associated with the Hamilton Coke & Iron Co., Hamilton, Ohio, jointly owned by the American Rolling Mill Co., Middletown, Ohio, and the Koppers Co., Pittsburgh.

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W. S. Pilling, Philadelphia, has returned from a stay of several weeks in Europe.

OBITUARY

EDWARD Y. MOORE, formerly president of the Chisholm & Moore Mfg. Co., Cleveland, died on Aug. 24, aged 80 years. He was born at Astoria, N. Y., in 1847 and lived for a time in Milwaukee and later in Chicago. He moved to Cleveland in 1903 and in that year organized the Chisholm & Moore company, of which his son, Samuel H. Moore, now is president. Mr. Moore in 1901, with the late Judge Elbert H. Gary, Charles M. Schwab, and others, organized and became vice-president of the Chicago Pneumatic Tool Co., New York, which was formed by a merger of five plants. He was an inventor as well as a business man and developed various hoisting apparatus and railroad appliances.

EDWARD Y. MOORE

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HENRY A. TAYLOR, who until retirement in January of this year was a director of the American Screw Co., Providence, R. I., died Aug. 26, at his home in Oak Park, Ill., aged 71 years. He began work in 1875 in the treasurer's office of the American Screw Co. at Providence, R. I., and in 1885, moved to Chicago to open the company's store of which he was manager from that date until his recent retirement. He also represented his company as western sales agent. He was president of the park board of Oak Park, and Taylor Park, in that city, was recently named for him.

—

SIR JOHN CECIL DAVIES, C. B. E., managing director of Baldwins, Ltd., London, died Aug. 29, at the age of 63. He had been a member of the Iron and Steel Institute since 1899.

Of a total of 24,678 gross tons of rails imported in 1926 into the port of Dairen, Manchuria, 25,156 tons were of American origin, while 8500 tons were Japanese-made, and the remaining 726 tons were drawn from a variety of sources, according to advices to the Department of Commerce from Consul S. Sokobin, Mukden, China.

Pays Tribute to Chairman Gary

At the regular monthly meeting of the board of directors of the United States Steel Corporation, held in New York, Aug. 30, at which President Farrell presided, the following resolution was adopted respecting Judge Gary, its late chairman:

> It is with profound sorrow that we are called upon to record the death of our beloved chairman, Hon. Elbert H. Gary, at his home in New York City, on the morning of Aug. 15, 1927.
>
> Judge Gary was the only member of the Board of Directors and of the Finance Committee of this corporation who served continuously from the time of its organization to the date of his death. He was the only chairman of the executive committee, being elected on April 9, 1901, and serving until Aug. 4, 1903, when the committee was abolished. On the same day he was elected chairman of the board and on Feb. 26, 1907, was elected chairman of the Finance Committee, continuing to hold both offices until the time of his decease.
>
> As a distinguished lawyer, as the foremost figure in the iron and steel industry, as a statesman in business, Judge Gary was well known in all parts of the world. Those high in position of authority in this and many other countries, were proud to honor him; leaders of finance and industry sought his counsel; others came to him for advice and sympathy; subordinates, including workers in the mills, called him friend. He was a patriot, a gentleman, simple and modest, yet when occasion demanded, aggressive and courageous. He was generous though never ostentatious in his benefactions.
>
> His was a full life—he lived more than fourscore years, he had traveled extensively, he was a lover of the best in music, art and literature, he had wealth—adding to his years could not have increased the respect, admiration and affection which men felt for him; the joys of great accomplishments were already his and so, in the scheme of things, his great soul passed on.
>
> We, the members of this board, who saw the creation of this corporation, and latterly have had the privilege of association with him in the management of its affairs, specially mourn his departure. He will be sadly missed, but he builded so well, and established in the organization methods and policies so firmly founded that we look into the future with confidence and courage.
>
> To his family, in their great sorrow, the board tenders sincere and deepest sympathy.

Production of automobiles during August will show an increase of at least 10 per cent over the July total according to *Automotive Industries*. And this, it adds, is so despite the fact that Ford Motor Co. has been completely down so far as manufacturing complete cars is concerned. The Ford contribution to output is not expected to be large before November.

European Mills See Recovery in Fall

Mills Maintain Prices — British Pig Iron Reduction Stirs Domestic Market — Japan Depressed by Chinese Boycott

(*By Cable*)

LONDON, ENGLAND, Aug. 29.

THE reduction in Cleveland pig iron prices caused substantial increase of domestic orders, but export demand is still slow. Hematite prices are rather easy. Middlesbrough makers are maintaining prices, but other Northeast Coast producers are reported to have sold at 2s. 6d. per ton (60c.) less. Foreign ore continues quiet with prices steady.

New business in finished iron and steel is delayed by the possibility of price reductions at the next meeting of makers.

Tin plate is still quiet but increased inquiry apparently indicates the existence of a fair volume of requirements.

Galvanized sheets are inactive but makers are maintaining quotations. Black sheets are dull with no fresh Japanese inquiries.

Considerable interest has been aroused by the proposal to grant rebates to merchants and consumers who buy only British steel. Most steel makers are reported favorable to this plan. The Dominion Iron & Steel Co. has booked 8000 tons of rails for shipment to Calcutta, India.

Continental markets are still fairly firm mainly because of curtailment of operations and belief on the part of mills that there will be an early revival of demand in the fall. Meanwhile, business is only moderate.

A French syndicate is believed to have secured the Chinese Eastern Railway order for 51,000 tons of rails and accessories. The Russian Jugostal and several German makers were also competitors for this order. The French colonial ministry is reported to have placed an order with Saar works for 60,000 tons of rails. Italian advices state that the local authorities at Pozzuoli have cancelled the shipbuilding concessions made to the Armstrong group because of alleged failure to keep promises made on liquidation in Italy.

BELGIAN MARKET STRONGER

Business Still Small But Mills Are Less Inclined to Shade—Less Foreign Competition

ANTWERP, BELGIUM, Aug. 13.—Although business is still limited with the usual summer quiet prevailing, mills are beginning to show less willingness to make concessions to secure orders and prices on many products are decidedly stronger. Producers believe that the market has reached bottom and that a slight upward turn is developing which should continue through the fall. French competition is less severe and Luxemburg mills are apparently no longer interested in bar business at less than £4 14s. per metric ton (1.03c. per lb.), which was being shaded as recently as a week ago. However, German sellers are evidently in need of some export tonnage and judging by recent reports are beginning to return to the market, especially for semi-finished business. On the whole the outlook is more favorable than for some time.

Pig Iron.—Reorganization of the pig iron entente has brought greater stability and some firmness to prices and in a few instances there have been slightly higher quotations reported. Phosphoric foundry iron ranges from £3 2s. to £3 5s. ($15.03 to $15.76) per ton, f.o.b. Antwerp, while the domestic market is about $17.15 per metric ton. Bessemer hematite iron is held at about $19.95 per ton, with British hematite being offered in the Belgian domestic market at about the same price. Large tonnages of coke are being sold and stocks are reported low. Half-washed furnace coke is quoted at $5.15 per metric ton.

Semi-Finished Material.—There has been no definite change in quotations on billets, blooms and slabs, but the market is showing greater firmness. This strength may prove only temporary as German mills are reported seeking business and British buyers are inquir-

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.85 per £ as follows:

Durham coke, del'd.	£0	19s.				$4.60		
Bilbao Rubio ore†	1	1	to £1	1¼s.		5.09	to	$5.15
Cleveland No. 1 fdy.	3	10				16.97*		
Cleveland No. 3 fdy.	3	7½				16.36*		
Cleveland No. 4 fdy.	3	6½				16.12*		
Cleveland No. 4 forge	3	6				16.00*		
Cleveland basic (nom.)	3	15	to	3	15½	18.18	to	18.30
East Coast mixed	3	15				18.18		
East Coast hematite	3	15½				18.30		
Rails, 60 lb. and up.	7	15	to	8	0	37.58	to	38.80
Billets	6	0	to	6	10	29.10	to	31.53
Ferromanganese	12	0				58.20		
Ferromanganese (export)	10	15	to	11	0	52.13	to	53.35
Sheet and tin plate bars, Welsh	5	11½	to	5	15	27.03	to	27.88
Tin plate, base box	0	18⅝	to	0	18⅝	4.46	to	4.52
Black sheets, Japanese specifications	13	15	to	14	0	66.68	to	67.90
						C. per Lb.		
Ship plates	7	12½	to	8	2½	1.65	to	1.76
Boiler plates	10	10	to	11	0	2.28	to	2.39
Tees	8	2½	to	8	12½	1.76	to	1.87
Channels	7	7½	to	7	17½	1.60	to	1.70
Beams	7	2½	to	7	12½	1.54	to	1.65
Round bars, ¾ to 3 in.	7	12½	to	8	2½	1.65	to	1.76
Steel hoops	10	10	to	11	0	2.28	to	2.39
Black sheets, 24 gage	10	5	to	10	10	2.22	to	2.28
Galv. sheets, 24 gage	13	15	to	14	0	2.98	to	3.03
Cold rolled steel strip, 20 gage, nom.	14	0	to	14	5	3.03	to	3.09

*Export price, 2½s. less for 500 tons or more.
†Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports

(Per Metric Ton)

Foundry pig iron: (a)								
Belgium	£3	0s.	to £3	0½s.	$14.55	to	$14.67	
France	3	0	to 3	0½	14.55	to	14.67	
Luxemburg	3	0	to 3	0½	14.55	to	14.67	
Basic pig iron:								
Belgium	2	19	to 3	0	14.31	to	14.55	
France	2	19	to 3	0	14.31	to	14.55	
Luxemburg	2	19	to 3	0	14.31	to	14.55	
Coke	0	18			4.37			
Billets:								
Belgium	4	7	to 4	9	21.09	to	21.34	
France	4	7	to 4	9	21.09	to	21.34	
Merchant bars:					C. per Lb.			
Belgium	4	15	to 4	16	1.04	to	1.06	
France	4	15	to 4	16	1.04	to	1.06	
Luxemburg	4	15	to 4	16	1.04	to	1.06	
Joists (beams):								
Belgium	4	13			1.01	to	1.04	
France	4	13			1.01	to	1.04	
Luxemburg	4	13			1.01	to	1.04	
Angles:								
Belgium	4	13	to 4	14	1.01	to	1.03	
⅛-in. plates:								
Belgium (a)	6	2	to 6	3	1.34	to	1.35	
Germany (a)	6	2	to 6	3	1.34	to	1.35	
3/16-in. ship plates:								
Belgium	6	1			1.31			
Luxemburg	6	1			1.31			
Sheets, heavy:								
Belgium	6	1			1.31			
Germany	6	1			1.31			

(a) Nominal.

ing for only small tonnages at low prices. Sheet bars are showing more strength and while £4 8s. ($21.34) per ton was easily obtained a week ago, the market today is about £4 9s. ($21.58) per ton. Billets are inactive at £4 7s. 6d. ($21.22) per metric ton for 2 to 2½-in. and £4 6s. ($20.85) per ton for 3 to 4-in. Blooms are also quiet at about $19.60 per ton for 6-in. and larger.

Finished Material.—Greater strength of prices is evidently the result of the disinclination of mills to make concessions rather than to any definite increase in the volume of business. This firm position of makers, particularly evident among the larger producers, has resulted in a slight advance in prices with steel bars quoted for export at about 6d. per ton higher price. Luxemburg mills are advancing toward a higher basis and French makers, with improved domestic business, are less active competitors for export tonnage. German mills, however, are more aggressive than in recent months, but thus far their competition has not caused any decline in the market. The ruling quotations on steel bars are from £4 13s. 6d. to £4 14s. per metric ton (1.02c. to 1.03c. per lb.), but some producers are asking £4 15s. per ton (1.04c. per lb.), which has apparently been the going price on occasional small lots. Beams show but little improvement, ranging from £4 12s. to £4 14s. per metric ton (1.01c. to 1.03c. per lb.). Angles are held at £4 13s. per ton (1.02c. per lb.) and corrugated bars at £5 2s. per ton (1.12c. per lb.). Sheets are slightly firmer with French mills, which have been keen competitors of Belgian producers, now at about the same level of prices.

JAPAN STILL DEPRESSED

Financial Situation Far From Solution—Chinese Boycott of Japan Injures Trade

WHILE the boycott in China is not considered to have reached serious proportions, say A. Cameron & Co., Kobe, Japan, in a metal market report for July, yet it is considered that the purchasing power of the average Chinese buyer is steadily being weakened by the internal strife and this is bound to have an ill effect on Japan's exports to that country.

During July the banks maintained their extremely conservative policy, which resulted in continued depression. A large number of the banks which were closed have not yet reopened. At the time of their closing, it was generally expected that their opening would be a matter of a few weeks. Thus the thousands of depositors had not viewed the matter very seriously. But the delay in opening these banks, as a result of the almost hopeless financial position most of them are in, is causing the public to realize that there is little likelihood of their getting their money returned, excepting possibly as a partial refund on the fixed deposits.

On June 27, the Kawasaki and the 100th banks signed a mutual agreement for merger. This is the largest amalgamation that has thus far taken place. The minister of finance is still striving to put the financial affairs of the country in order but very little headway has been made. There has been a heavy slump in the price of raw silk brought about by the necessity of the filatures of liquidating their early deliveries, being unable to obtain the usual assistance from banks. The agitation for the boycott of Japanese goods in China has also increased the generally unhealthy condition of the market.

Shrinkage in Japanese Home Trade

Trade returns for the last 10 days of July showed an excess of exports over imports of some 17,000,000 yen. On the other hand there has been a large shrinkage in the total trade of the country. It seems doubtful that the very serious situation in Japan is appreciated in New York and London: the fact that nearly 100 banks are apparently insolvent and that Suzuki & Co. is only one of some 50 Japanese trading companies that are bankrupt. The value of the yen has kept up remarkably well, probably mainly due to the absence of any bear drives from overseas markets, which are apparently uninformed of the true state of affairs in Japan.

The Kawasaki Dockyard Co. has been kept in part operation by the naval authorities, as a few warships are under construction at the yards. Probably one of the large financial interests of the country will purchase the dockyard later. No great revival in imports of metals is expected until the financial depression is ended. Meanwhile the Government is seriously contemplating a revision of the tariff to protect local industries further.

Sheets in Small Demand

Demand for black steel sheets from the rural districts declined considerably during July, as this is the busy season for farmers. The Osaka market was very quiet, as is usual during this month. However, there were a few parcels offered for prompt delivery, which tended to weaken the market, after remaining fairly steady the past few months. Present prices are about 10 sen per sheet lower than in the same period of last year and demand is also reported to be less. It is reported that the Kawasaki sheet mills will be continued in operation, but the production figures are not yet available. At the end of July American sheets, "Eagle" brand, 13 to the bundle, were quoted at 73 sen (35c.) per sheet and British "Raven" and "Globe" brands were quoted at 72 sen (34c.) per sheet.

New arrivals of tin plate are smaller than expected and stocks are not too heavy for current consumption, which continues slack as the demand from can makers has almost ceased. Although the market has been rather inactive, prices recovered slightly during July. Buyers are still delaying placing future contracts with foreign suppliers, as they ordinarily do at this period in preparation for the fall demand. American prime coke tin plate is quoted at 12.45 yen ($5.88) per 100-lb. box and 22.45 yen ($10.60) per 170-lb. box. British primes are quoted at 12.20 yen ($5.76) per 100-lb. box and 22.20 yen ($10.49) per 170-lb. box.

Although the market on structural material has been slack, prices recovered in line with the official quotations of the Yawata Steel Works. It is reported that the Yawata works has concluded an arrangement with the four big operators, Mitsui Bussan Kaisha, Mitsubishi Shoji Kaisha, Iwai & Co. and Ataka & Co., whereby these four companies are to take the greater part of the Government works' production of all kinds of construction materials. It is believed that this will avoid unnecessary competition among the operators who are handling this material and will place the works in a better position.

Large Japanese Dockyard Finally Suspends

TOKIO, JAPAN, Aug. 9.—The Kawasaki Dockyard Co., which has been operating its shipyards following serious financial difficulties, has entirely suspended operations. At first the Government appeared ready to render the necessary assistance to operate the shipbuilding branch of the company, as the Navy had several cruisers under construction at the Kawasaki yards. Later, however, it was decided that no pecuniary assistance would be given and the dockyards were compelled to operate on their own resources.

The principal cause of the Government's withdrawal of assistance to the company is said to be the definite steps taken by Okura & Co., one of the creditors, in attaching the Kawasaki company's assets to protect their own interests. This action was the culmination of a protracted law suit over pig iron. With the prospect of similar action by other creditors of the Kawasaki Dockyard Co., the Governmnt was not inclined to become involved.

The Kawasaki interests are said to be making an effort to continue operation, as the yards are an important factor in the industry of Kobe and the general prosperity of the city would be affected by their total suspension. Meanwhile, it is reported that the Navy will probably continue construction of its cruisers, using workmen in the Kawasaki company's employment.

CHINA BUYS AMERICAN SHEETS

Japanese Boycott Diverts Business to United States—Manchuria Buying Rails

SHANGHAI, CHINA, Aug. 12.—As a result of the Japanese boycott there has been some improvement in the sale here of "Apollo" galvanized sheets. Prior to the boycott sales of Japanese sheets in Shanghai alone averaged 200 to 300 tons a month. It is reported that dealers who continue to deal in Japanese sheets have been threatened with imprisonment and the result is evidently the recent sales of American galvanized sheets to the total of more than 400 tons a month.

There has been a slight increase in purchases of American steel pipe, but the tin plate market has been inactive for the past month or more. Large lots of tin plate are on order and local market prices have declined.

Business during the first half of this year has been almost normal compared with the unsatisfactory conditions generally prevailing in the past year or more. Sales of American products are confined largely to tin plate, galvanized sheets, rails and a few miscellaneous products. European competition on bars, angles, beams and plates continues severe, and low Belgian prices on wire nails and other wire products has eliminated American competition.

Manchurian business has also been active during the first six months of this year. The United States Steel Products Co. has secured nearly 10,000 tons of rails and some desirable orders for telegraph and telephone wires, as well as considerable miscellaneous business. Among pending inquiries from Manchuria are about 17,000 tons of 80-lb. rails, which are expected to go to the United States, as it is understood that open-hearth material is wanted. The German competition for this order, based on supplying Bessemer rails, has been keen and in some quarters it is considered doubtful that the railroad will consider American rails at the difference in price.

The outlook for the remainder of this year is considered by merchants to be good and should the Japanese boycott continue considerable business in galvanized sheets is expected to go to American sellers. Unless there is some unexpected political shift, business is expected to continue as in the first half of the year with about the same volume of purchasing.

Chinese Iron Works to Be Nationalized

TOKIO, JAPAN, Aug. 9.—A report from Shanghai states that the Bu-Hang Government has appointed a committee to investigate the Hanyang Ping Iron Works with the object of direct governmental control. The Government states that its intention is to return the works to its former condition, clearing up the present confused and disordered conditions of management.

Reparations Bring Large Orders to Germany

HAMBURG, GERMANY, Aug. 13.—It is perhaps noteworthy that Jugoslavia, Rumania and Greece, which place considerable railroad material business each year, have purchased between 80 and 90 per cent of their requirements in Germany on reparations account.

This situation is viewed with great disappointment by French and British producers, as hitherto Rumania and Greece were good customers and the old Serbia also a very good buyer of French and British railroad material manufactures. Rumania has just purchased a total of about 48,000,000 m. worth of railroad material from various German makers, a part of which is to be applied on reparations account. The order is for about 35,000,000 m. worth of rails and track supplies and equipment valued at about 13,000,000 m. This will be delivered over a period of 18 months.

Jugoslavia has purchased nearly 200,000,000 m. worth of railroad material in the past four years, the greater part of which was charged to reparations account. About 147,000,000 m. worth of these purchases has been delivered. Included were 511 locomotives, 733 passenger and 1470 freight cars and other equipment. Greece has purchased about 39,000,000 m. worth of railroad material charged to reparations and about 17,000,000 m. worth paid for on terms. Meanwhile orders placed with other countries have been about 20 per cent of these totals.

Strikes Diminishing in Germany

HAMBURG, GERMANY, Aug. 14.—German steel industry experienced one of the quietest labor years in 1926 that has occurred in almost 40 years. The total working days lost by strikes was 115,883 and the loss by lockouts was 79,482 days. This compares with a total loss by strikes and lockouts during 1925 of 2,664,762 days and in 1924 of about 4,000,000 days. Figures for other industries were also only about 10 to 20 per cent of the strike and lockout losses of preceding years. The following comparison of successful, partly successful and unsuccessful strikes in all industries in 1920, 1922, 1924 and 1926 tends to show how the strike has been diminishing in strength.

	Successful Strikes (Per Cent)	Partly Successful Strikes (Per Cent)	Unsuccessful Strikes (Per Cent)
1920.....	38	41	21
1922.....	32	43	25
1924.....	24	49	27
1926	13	54	33

Canadian Iron and Steel Output Lower in July

TORONTO, ONT., Aug. 30.—The production of pig iron in Canada during July amounted to 50,997 gross tons. This output was 17 per cent less than the 69,437 tons made in the previous month and 14 per cent under the 67,232 tons reported for the corresponding month last year. For the seven months ended with July, the cumulative production of pig iron was 454,710 gross tons, an increase of 4 per cent over the 438,096 tons reported for the corresponding period of 1926, and 46 per cent over the output for the first seven months of 1925. This year's output included 320,468 tons of basic iron, 107,730 tons of foundry iron and 26,512 tons of malleable iron. There were six furnaces blowing out of a total of 18 in the Dominion, the six having a daily output of 2375 tons, or 47 per cent of the total capacity of all blast furnaces in Canada.

The production of ferroalloys during July amounted to 4510 tons, a slight increase over the 4418 tons produced in the previous month.

Production of steel ingots and castings in July reflected the lower output of pig iron by falling to 55,250 tons, a decline of 8 per cent from the 59,940 tons of June. For the first seven months of this year production of steel ingots and castings totaled 542,560 tons, a gain of 9 per cent over the 496,031 tons for the corresponding period of last year and 22 per cent over the 446,168 tons made during the first seven months of 1925. This year's output included 515,169 tons of steel ingots and 27,391 tons of direct steel castings.

Trade Piracy Penalized in Japan

The Champion Spark Plug Co., Toledo, Ohio, has been successful in putting a stop to piracy of its patents in Japan. Taking court action in that country against Japanese manufacturers of and dealers in spurious "Champion" spark plugs, it forced them to agree to hand over all such spark plugs in stock and to make every effort to secure all such plugs from other places. The manufacturers, moreover, were required to publish a signed apology at their own expense in leading Japanese papers. The manufacturers and dealers together were forced to deposit the sum of 10,000 yen for one year to insure the carrying out of their promises and, in addition, 2,000 yen to defray the expenses of any action that might be necessitated by violation of their agreement. Of the larger sum of 10,000 yen, 5,000 yen shall be immediately forfeited on the failure of either the manufacturers or dealers to carry out the agreement, while 10,000 yen shall be forfeited if both default.

IMPORTS FROM GERMANY SMALL

Decision on Alleged Dumping Awaited—Japan Buys Tin Plate and Pipe Here

NEW YORK, Aug. 30.—Importers of European steel report but little current business, with most of the transactions confined to material other than of German origin. Thjs temporary disinclination of importers to handle German steel is a result of the recent hearing in Washington on the question of dumping. Should the Treasury Department decide that dumping had occurred, importers point out that if the decision is made retroactive imports over the past year might be subject to extra duty. Meanwhile prices of Continental steel are unchanged but quite firm at about 1.70c. per lb., base, c.i.f., duty paid, for Thomas grade plain steel bars, about 1.65c. per lb., base, for structural material, and from 1.85c. to 1.90c. per lb., base, for open-hearth reinforcing bars.

Trade with the Far East continues small. Japanese merchants are reported showing some interest in light gage black sheets, but current inquiries, including one for 1000 tons and another for about 500 tons, are believed by exporters here to be principally for the purpose of valuing present stocks of American sheets, as the British market is still several dollars a ton lower. Tin plate is reported slightly firmer in the export market and except on large orders it is doubted that the low prices which have prevailed in recent months could be duplicated today.

Among recent purchases by Japanese companies are the 24,000 base boxes of oil can tin plate for the Kioto Oil Co., placed with the two leading Japanese export houses and understood to have been about equally distributed among the three leading American producers. The Tokio Gas Co. has closed on 1,650,000 ft. of black gas pipe, which was awarded by the exporter here to the leading export interest and a large independent producer.

Larger Imports of Iron Ore

Iron ore imported into the United States in July amounted to 252,162 tons, a gain of 9 per cent over the June figure of 231,815 tons, and a corresponding increase over July, 1926. For the seven months of the current year, imports have run more than 6 per cent ahead of last year. Details by countries of shipment are shown in the table.

Sources of American Imports of Iron Ore

(In Gross Tons)

	July		Seven Months Ended July	
	1927	1926	1927	1926
Chile	104,400	110,800	772,300	797,800
Cuba	27,613	57,200	250,613	315,700
Spain	.....	8,840	3,919	79,055
Sweden	57,125	.....	153,253	14,921
French Africa	44,013	35,331	263,044	204,537
Canada	3,581	1,094	7,790	13,985
Other countries	15,430	19,582	124,675	56,833
Total	252,162	232,847	1,575,594	1,482,831

Fabricated Steel Plate Bookings Continue at Low Level

July bookings of fabricated steel plate are reported by the Department of Commerce at 35,320 net tons, or 43.9 per cent of capacity. Returns were from 51 firms, an increase over the number in some of the preceding months. Accordingly the Department has issued revised tables showing the monthly totals since January, 1923, and the distribution in principal lines of consumption. The July total, while larger than the June figure of 28,831 tons, is with the further exception of last December the smallest since January, 1926. It brings the total for seven months to 300,545 tons, which is considerably heavier than for the first seven months of any year since 1923, when the total was 410,028 tons. The first seven months of 1926 showed 286,178 tons.

Oil storage tanks took nearly half the July total, or 17,199 tons. This is much higher than in the two preceding months, but is about the average of the first six months of the year. It is 17 per cent above the average month of 1926, but only about two-thirds the average of 1923. Refinery materials and equipment accounted for 2057 tons. Except for June and the previous December, this is the smallest total since January, 1926. It is nearly 10 per cent below the average of the first half of this year and is about two-thirds the average month of 1926.

Tank cars taking 225 tons and gas holders taking 1034 tons were respectively the smallest for those items of consumption since July, 1924. Blast furnaces took 537 tons. This is 16 per cent below the average month of the first half of the year and is only about half the average month of the three preceding years. Stacks and miscellaneous uses absorbed 14,268 tons. This is the smallest total in this group since January.

Two-Thirds of Fluorspar Requirements Mined in United States

Annual production of fluorspar in the United States has averaged about 130,000 net tons yearly since 1922. Production of the leading States in 1926, as quoted from advance sheets of *Mineral Resources*, published by the Bureau of Mines, is:

Kentucky, 62,494 tons; Illinois, 53,734 tons; Colorado, 10,440 tons.

Colorado shippers received $4.30 per ton less than the others, which difference was absorbed by freight rates. In the same year 75,671 net tons of fluorspar were imported, principally from United Kingdom, Germany and France, despite the import duty of $5 per net ton.

The average value of the home production was $18.20 per net ton. The bulk of it is used in the manufacture of basic open-hearth and electric furnace steel. Consumption varies in various plants, owing to different chemical analysis of raw materials, method of working, and quality desired in finished steel. The principal consumers and the average price they paid are:

	Net Tons	Per Net Ton
Steel makers	105,614	$16.51
Foundries	6,212	19.55
Glass makers	7,507	32.01
Enamel	3,410	33.27
Chemicals	3,782	23.20

Stocks of Industrial Coal Shrinking

Industries in the United States and Canada had 58,448,000 net tons of coal on hand on Aug. 1, according to estimates of the National Association of Purchasing Agents. This is a drop from 62,800,000 tons on July 1, and is a continuation of the steady drop since the maximum was reached on April 1, of 77,455,000 tons. At current rates of consumption, however, there remain 55 days' supply against 54 days' a month earlier and 54 days' two months earlier. Except for the 56 days' at the end of April, the present supplies apparently will carry industry further into the future than the supplies at any time in more than two years.

Consumption in July is reported at about 10 per cent less than in July, 1926. The amount reported was 32,658,000 tons, being an average daily consumption of 1,053,500 tons. Production of bituminous coal during July, according to the Bureau of Mines, was 33,563,000 tons, or more than 6 per cent under the June total. Combined production of bituminous and anthracite reached 38,597,000 tons.

The association estimates that if non-union coal production, which is now about 9,000,000 tons a week, can be built up to 10,000,000 tons a week, stocks will decrease at about 4,500,000 tons a month. Under these conditions it would take the remainder of this calendar year to reduce present stocks to what heretofore has been considered a normal stock condition.

New orders for steel boilers in July are reported by the Department of Commerce at 1501 units, aggregating 1,763,952 sq. ft. of heating surface. This is the largest area reported for any month this year, comparing with 1,364,786 sq. ft. in June and with the previous maximum of 1,500,503 sq. ft. in April. For the seven months elapsed there have been orders for 9540 units, amounting to 10,045,709 sq. ft.

Exports Higher and Imports Lower

Iron and Steel Sent Abroad in July Was 3 Per Cent Above June, While Imports Were Near the Smallest Tonnage in 32 Months

WASHINGTON, Aug. 29.—Exports of iron and steel in July, as reported briefly in THE IRON AGE last week, amounted to 190,502 gross tons, showing an increase of 6138 tons over June. The total was about 4000 tons less than in July, 1926, according to figures reported by the Department of Commerce. For the seven months of the calendar year exports have aggregated 1,322,370 tons, a gain of more than 8 per cent over last year. Of this gain of 101,000 tons, 50,000 tons represented increased scrap exported, 54,000 tons of tin plate, and 20,000 tons rails. Some items showed losses.

As will be noted from the export table, the tonnages of boiler tubes and of tin plate for the seven months this year, almost identically the same at 172,600 gross tons, were the largest items in the entire list.

Imports Fall Off

Imports in July at 61,112 tons showed a drop of nearly 12 per cent from June and represented, with two exceptions, the lowest month's total in the past 32 months. Those exceptions were February and April of this year. The largest single item in July was structural shapes, which showed a substantial gain over last year, both in the month's and in the seven-month figures. Pig iron took second position, with cast iron pipe third, then wrought tubular products, steel bars, and hoops and bands.

There was a sharp falling off in pig iron imports from more than 32,000 tons last year to less than one-third that amount this year. Steel bars dropped nearly one-third in July, compared with a year ago, and cast iron pipe a similar proportion. Wrought tubes, on the other hand, showed an increase of more than 55 per cent, while hoops and bands quadrupled over the July figure of last year.

Manganese ore imports were considerably lower in July than in June and showed a corresponding decline from July, 1926. For the seven months the total is about 11 per cent under the corresponding period of last year.

Exports of Iron and Steel from the United States

(In Gross Tons)

	July		Seven Months Ended July	
	1927	1926	1927	1926
Pig iron	4,182	2,595	26,721	11,711
Ferromanganese	98	55	391	344
Scrap	17,499	8,910	121,552	71,316
Pig iron, ferroalloys and scrap	*21,779*	*11,560*	*148,664*	*83,169*
Ingots, blooms, billets, sheet bar, skelp	10,616	13,783	49,951	42,956
Wire rods	679	775	9,291	10,416
Semi-finished steel	*11,295*	*14,558*	*59,242*	*53,372*
Steel bars	9,340	11,962	65,916	80,024
Alloy steel bars	423	716	3,452	3,291
Iron bars	597	412	3,113	2,559
Plates, iron and steel	11,209	10,844	81,561	79,095
Sheets, galvanized	15,095	14,883	101,047	103,221
Sheets, black steel	16,173	17,277	106,374	108,554
Sheets, black iron	1,248	1,067	10,141	11,952
Hoops, bands, strip steel	3,176	4,251	28,547	30,046
Tin plate; terne plate	19,845	20,197	172,611	118,539
Structural shapes, plain material	13,144	12,478	79,259	88,397
Structural material, fabricated	4,263	7,067	36,682	50,711
Steel rails	13,137	20,241	111,141	91,229
Rail fastenings, switches, frogs, etc.	3,956	4,251	22,020	24,416
Boiler tubes, welded pipe and fittings	24,779	25,956	172,628	160,323
Plain wire	3,637	2,420	19,543	21,862
Barbed wire and woven wire fencing	5,385	4,730	28,634	35,547
Wire cloth and screening	240	228	1,370	1,210
Wire rope	317	284	2,748	2,902
Wire nails	1,193	1,241	4,765	7,428
Other nails and tacks	819	767	4,818	5,143
Horseshoes	38	20	285	347
Bolts, nuts, rivets and washers, except track	1,206	1,252	6,959	8,321
Rolled and finished steel	*149,220*	*162,544*	*1,063,614*	*1,035,265*
Cast iron pipe and fittings	2,984	1,875	16,104	20,871
Car wheels and axles	1,422	1,336	11,027	9,910
Iron castings	930	865	6,729	5,342
Steel castings	545	562	4,733	5,222
Forgings	540	214	3,269	1,723
Castings and forgings	*6,421*	*4,852*	*41,862*	*43,048*
All other	1,787	1,203	8,988	8,446
Total	190,502	194,717	1,322,370	1,223,374

Imports of Iron and Steel into the United States

(In Gross Tons)

	July		Seven Months Ended July	
	1927	1926	1927	(a)1926
Pig iron	10,377	32,206	71,196	349,462
Ferromanganese*	2,724	620	15,152	23,809
Ferrosilicon†	193	1,082	5,856	6,374
Ferrochrome (b)	.....	.....	382	341
Scrap	3,260	2,969	37,182	35,970
Pig iron, ferroalloys and scrap	*16,554*	*36,877*	*129,768*	*415,417*
Steel ingots, blooms, billets and slabs	1,111	1,990	7,657	20,998
Wire rods	891	511	7,490	5,399
Semi-finished steel	*2,002*	*2,501*	*15,147*	*26,361*
Rails and splice bars	600	4,158	10,714	36,340
Structural shapes	12,606	10,613	87,942	58,434
Boiler and other plates	188	492	2,728	3,566
Sheets and saw plates	1,645	472	9,164	3,784
Steel bars	5,697	8,256	56,521	62,589
Bar iron	425	160	2,807	3,385
Hoops, bands and cotton ties	5,447	1,303	20,139	12,193
Tubular products (wrought)	6,693	4,255	39,137	15,779
Nails, tacks, staples	832	449	4,006	2,366
Tin plate	31	65	923	2,007
Bolts, nuts, rivets and washers	47	23	184	262
Round iron and steel wire	372	410	2,723	2,389
Barbed wire	125	29	2,971	2,171
Flat wire; strip steel	185	369	1,606	2,113
Steel telegraph and telephone wire	1	2	31	121
Wire rope and strand	157	389	1,520	1,575
Other wire	36	173	291	1,221
Wire cloth and screening	.....	41	.....	237
Rolled and finished steel	*35,087*	*31,659*	*243,407*	*212,059*
Cast iron pipe	7,381	11,159	54,931	39,959
Castings and forgings	88	215	1,791	1,584
Total	61,112	82,411	445,044	694,428
Manganese ore*	27,948	34,133	207,833	234,594
Iron ore	252,162	232,847	1,575,594	1,482,831
Magnesite	3,937	4,951	53,524	53,337

*Manganese content only.
†Silicon content only.
(a) Revised figures.
(b) Chromium content only.

The air mail is being used by the Beardsley & Piper Co., Chicago, manufacturer of sand conditioning and conveying equipment, including Sandslingers, to distribute the entire issue of a new publication it has printed. The total number is about 4500 copies and more Lindbergh stamps were required than were available at the Chicago post office. It follows that the circulation will require the use of every air mail service route in the country.

WHERE STEEL EXPORTS WENT

Canada Took the Largest Amount, with Japan Second and Italy in Third Position

ALMOST precisely half of the United States exports of iron and steel in July went to other parts of North America, Central America and the West Indies, according to figures of the Department of Commerce. Canada absorbed more than two-thirds of this portion. South America took about one-sixteenth of the total, Europe about one-eighth and the Far East about one-fifth.

Similar proportions held for the seven months of the calendar year, except that Europe's share was only 8½ per cent, while the Far East, including particularly Japan, took a larger proportion than during the month of July. Details are shown in the table.

Destination of Iron and Steel Products Exported from the United States

(In Gross Tons)

Country of Destination	July, 1927	January Through July 1927	January Through July 1926
North and Central America and West Indies	*94,589*	*653,126*	*645,622*
Canada and Newfoundland	67,994	500,931	483,980
Cuba	10,305	51,999	52,065
Mexico	7,919	52,521	60,066
Guatemala	390	4,750	7,969
Salvador	253	2,924	11,480
Panama	3,056	12,551	4,887
Other British West Indies	944	8,642	5,410
Other West Indies	2,693	11,168	9,729
Other Central America	1,035	7,640	10,036
South America	*32,406*	*218,372*	*198,226*
Argentina	8,660	51,289	34,955
Brazil	5,307	46,594	24,450
Chile	4,540	19,879	36,802
Colombia	5,955	37,323	36,994
Peru	4,937	22,239	19,835
Venezuela	2,418	32,225	38,475
Other South America	589	8,823	6,715
Europe	*24,046*	*114,724*	*79,895*
France	230	3,361	7,055
Italy	11,350	37,142	22,187
Rumania	88	1,307	2,057
Russia	2,067	4,196	2,807
Turkey	27	2,099	2,232
United Kingdom	6,339	43,181	32,051
Other Europe	3,945	23,438	11,506
Far East	*37,824*	*324,037*	*290,089*
Australia	1,058	16,557	13,827
British Malaya	825	6,487	5,133
China	2,947	35,751	21,567
Dutch East Indies	3,573	23,701	19,869
India	1,122	15,820	19,938
Japan and Chosen	19,101	167,504	156,345
Kwangtung	434	15,297	7,599
Philippine Islands	7,899	33,958	39,055
Other Asia and Far East	865	8,962	6,756
Africa	*1,637*	*12,111*	*9,542*
British South Africa	665	5,258	4,796
Egypt	622	2,859	3,237
Portuguese East Africa	90	3,189	1,261
Other Africa	260	805	248
Total	190,502	1,322,370	1,223,374

Institute's Statistical Report

The annual statistical report of the American Iron and Steel Institute for 1926 has appeared. It was printed by the J. B. Lippincott Co., Philadelphia. There are 102 + vii pages, devoted to the tabulation of production and a number of other items, in accordance with the practice of many years past. Pig iron statistics were made in accordance with the definition of pig iron given in the report of the special committee, consisting of John A. Topping, chairman; James A. Farrell and Eugene G. Grace. This definition is as follows:

> A metallic product, the result of blast furnace or electric smelting of iron ores, which is used as part or all of the initial metallic charge in steel making, puddling and producing molten metal for foundry use.

Changes made in this volume show separately the production of pig iron and of ferroalloys. An analysis of production reported for previous years has been made and tables are prepared, showing this separation of these products for 1900 to 1926, inclusive. Years previous to 1900 do not afford the necessary data for making such a separation. It may be noted that the ferroalloys represented about 2½ per cent of the total in 1900 and considerably less than 2 per cent in the years since 1918. The total of ferroalloys has more than doubled between 1900 and 1926, but the rate of increase has been much less than that for pig iron.

Considerable Reduction in Malleable Castings

Malleable castings production in July is reported by the Department of Commerce at 48,202 tons, the smallest total since last November, and, with that exception, the smallest in more than two years. There was a reduction of about 18 per cent from the June total of 58,972 tons and of more than 13 per cent from last July's 55,555 tons. Shipments were close to production and correspondingly were lower than for several months. Orders booked, at 45,782 tons in July, showed the smallest total of any month so far this year, but larger than the three latest months of 1926. Capacity was operated to the extent of 43.9 per cent, compared with 55.3 per cent in June.

For the seven months production has been 399,298 tons. This is a drop of more than 10 per cent from the first seven months of last year, when the total was 446,472 tons. Shipments in seven months have been 390,362 tons, against orders booked of only 360,398 tons. These figures compare with 431,513 tons in shipments in seven months last year and 386,063 tons in orders booked. A few small plants did not report orders, but these represented in July less than 6 per cent of the production reported.

Manufacture of Electrical Machinery

Products of the electrical machinery industry, including apparatus and supplies, made a larger total in 1925 than in any previous year reported upon by the Bureau of the Census. The aggregate was $1,540,002,041, a gain of 19.1 per cent over the previous high figure, recorded in 1923. The value added by manufacture, which is the true measure of the industry, was $903,309,965, a gain of 21.4 per cent over 1923. Secondary products of other industries added about 8 per cent to the total figures given.

Wage earners received $323,834,541 in payrolls distributed among the 239,921 wage earners in 1739 establishments. Both the payroll and the number of wage earners, while showing increases from 1923, were lower in relation to the value of products and to the value added by manufacture than in any previous census year.

Numerous details regarding the production of the various types of apparatus and the distribution of the industry over the various States appear in a pamphlet covering the subject and obtainable at 5c. each from the Superintendent of Documents, Government Printing Office, Washington.

Activities of American Engineering Standards Committee

According to the 1927 Year Book of the American Engineering Standards Committee, it costs $40,000 in salaries and $20,000 in expenses to conduct the committee's activities. This amount is raised through dues of 24 member organizations and contributions from 323 sustaining memberships.

Work is in progress on 125 projects, of which 26 were instituted during the fiscal year. Some 21 standards were finally approved in the 12 months. Among these are standards for spiral steel rods for concrete reinforcement, tee-slots for small machine tools, tooth form for spur gears, shafting keys, wrench head bolts, hard-drawn aluminum conductors, tubular steel poles, 7-in. girder rails, and wire rope, and safety codes for abrasive wheels, presses, forging, and for automobile brakes.

Finished Trend to World Exports

(*Continued from page* 537)

an American development. In any event this distinction, based on process, probably would not be extended generally to export classifications. Due to extensive use for light stampings and for all sorts of press and die work, especially in the automobile industry, the United States is by far the largest consumer of strips of all kinds. While importing specialties, mostly tool steel qualities, it is also the largest producer and one of the largest exporters.

The tonnage reported for *sheets and plates* is less now than formerly, but this is due solely to the reduced demand for ship plates. There has been a real increase in the use of sheets in South America and in the Far East, particularly in Japan, which has lately set up a tariff-protected galvanizing industry, buying its black plate (sheets) mostly from the United States and Great Britain.

The world's *tin plate* trade is a virtual monopoly held by Great Britain and the United States. It has grown definitely since 1913, although this fact is partially obscured by the British strike in 1926, which tended to reduce supplies. Since tin plate is now made in India and to an increasing extent in several European countries, the growth in total exports seems all the more remarkable. Except in highly developed countries, oil companies are still the principal consumers. In fact, the new industry in India is financed jointly by the Burma Oil Co. and the Tata interests. Oil is now shipped by sea almost exclusively in tank steamers, and is packed in 5-gal. cans in the countries in which it is distributed.

The principal growth in tin plate exports, however, results from the rapid development of canning industries and, especially in the Far East, of the local manufacture of household utensils. Most of this increased business has been gained by the United States, as the British industry slumped badly after the war and had barely recovered its pre-war volume when it was set back again by the coal strike. American exports, meanwhile, doubled and then quadrupled.

Like tin plate, *galvanized sheets* are supplied mainly by the United States and Great Britain. Notably in India, China and Japan they are in growing demand for making various utensils. But the principal consumption, both of plain and corrugated sheets, is for structural purposes, both for house gutters and similar permanent equipment and for temporary shelters. The establishment of a domestic Japanese industry has cut deeply into the trade, as Japan is one of the leading buyers of these sheets. But business elsewhere has expanded so that the total volume has been maintained fairly well.

Shrinkage in the international demand for *rails* has become common knowledge. Present-day trade is not quite equal to that of 25 years ago, and it is over 50,000 tons a month less than it was just before the war. Looking back only a year or two, the slight upward tendency is explained by increased imports into the United States, Germany, and even England, although these countries are all exporters. The Great War called a halt to the era of railroad building. In 1913, projected mileage in Russia, India, Africa and South America was expected to require fully 25,000,000 tons of permanent-way material. Only a fraction (about 10 per cent) of these new lines have been constructed, and optimistic forecasts that other projects would quickly revive, and thus create a record demand for steel, have not been fulfilled. On the contrary, even maintenance and ordinary replacements were allowed for some time to fall behind.

New railroads will be built, because better transportation facilities are a necessary forerunner to better industrial development. But the other element in the situation is that this construction must first be financed to a considerable extent in Europe. Europe, however, has scarcely yet repaired the damage done by the war (and by the disorganization of her industries subsequent to the war), and hence not only has little to spare for financing projects overseas but even absorbs for her own needs part of the outgoing stream of American capital.

Still another important explanation of the apparent shrinkage in demand is the fact that India, which is now producing 10,000 tons, and Australia, with

Table II.—Changes in Iron and Steel Exports by Countries and Commodities, 1913 to 1925

[Increases (+) and Decreases (—) in Monthly Averages, Expressed in Thousands of Metric Tons]

Commodity	United States	Great Britain	France	Germany (a)	Belgium (a)	Total
Pig iron and alloys	—21.6	—47.7	+49.9	—52.1	+ 6.7	—64.8
Semi-finished (b)	...	...	+156.0	—49.4	+ 2.2	+108.8
Bars, iron and steel	—15.8	— 9.9	...	—53.0	+97.0	+18.3
Shapes	—15.8	— 5.0	+ 6.1	—38.0	+15.6	—37.1
Hoops and strips	+ 2.0	+ 1.3	+ 2.6	— 5.3	+ 2.6	+ 3.2
Plates and sheets	—18.1	+ 6.5	+13.7	—18.3	+ 5.4	—10.8
Tinplate	+ 7.4	+ 1.5	0.0	0.0	— 0.3	+ 8.6
Galvanized sheets	+ 3.8	— 4.1	+ 0.9	— 1.6	+ 0.6	— 0.4
Rails	—25.5	—24.6	+13.8	—17.2	+ 0.5	—53.0
Pipes and fittings	— 0.8	— 9.5	+ 5.3	+ 1.1	+ 1.2	— 2.7
Wire and wire products	— 8.7	+ 0.3	+12.9	—10.2	+ 9.5	+ 3.8
Sundries	—10.8	—13.5	+28.1	—18.3	— 8.6	—23.1
Total	—103.9	—104.7	+289.3	—262.3	+132.4	—49.2

(a) Luxemburg included with Germany in 1913 and with Belgium in 1925.
(b) Includes ingots.

Table I.—Total Exports of Iron and Steel from Six Leading Countries

[Monthly Averages in Thousands of Metric Tons]

Commodity	1913	1920	1921	1922	1923 (a)	1924 (a)	1925	1926
Pig iron and alloys	201.5	107.8	108.2	158.6	143.9	135.7	136.7	138.1
Ingots and semi-finished (b)	142.9	69.9	87.7	159.5	212.0	179.6	251.7	285.9
Bars, iron and steel (b)	158.7	93.0	43.4	76.7	62.7	157.1	177.0	201.5
Shapes (b)	104.7	88.3	27.8	34.3	41.8	51.4	67.6	90.2
Hoops and strips	5.7	9.8	3.7	7.4	10.8	9.5	11.6	27.2
Plates and sheets	127.4	184.9	92.1	88.9	102.5	111.9	116.6	142.1
Tinplate	48.3	49.0	28.3	44.5	57.2	60.6	56.9	56.4
Galvanized sheets (c)	79.3	45.9	25.9	55.2	62.5	67.0	79.0	73.9
Rails (d)	142.9	83.5	89.9	96.8	89.6	81.5	89.9	112.8
Pipes and fittings	84.2	59.2	65.4	56.2	58.4	52.2	81.5	93.5
Wire and wire products	77.4	72.7	43.4	65.1	62.0	61.6	81.2	98.3
Sundries	202.7	111.4	74.4	141.0	138.7	158.0	177.8	183.0
Total	1,375.7	975.4	690.2	984.2	1,042.1	1,126.1	1,327.5	1,503.9

(a) Due to occupation of the Ruhr, German figures are incomplete for 1923 and 1924. (b) Bars are partly included with semi-finished products and, conversely, some structural material is included with bars. (c) Includes other coated sheets. (d) For some countries, fishplates are included with rails, but the bulk of fishplates and sleepers, as well as wheels, axles, and other railroad material except rails, are included in "Sundries."

nearly 7000 tons of rails a month, are now able to cover most of their needs without importing.

Great Britain and the United States have been the chief losers in the slump. Even Germany is rapidly recovering its pre-war rail export tonnage, while France, which inherited most of the former German rail mills, and Belgium are forging rapidly ahead. Under the various rail pools that existed before the war, Great Britain's quota was always over one-half and at one time almost two-thirds of the total. But under the present European Rail Makers' Association the conditions are reversed, Great Britain's allowance combined with the expected contribution of the United States being well under 50 per cent.

Cheap Iron for French Cast Pipe

The figures for *pipes and fittings* show a heavy loss in the exports from Great Britain and one which, in 1925, was apparently not quite offset by increased shipments from the Continent. Actually, however, there was a considerable increase. Unfortunately, French statistics include cast iron pipe with railroad chairs and machinery castings. Hence the really large increase in French exports of such pipe can not be shown in the tables. Undoubtedly, however, most of the increase under this indefinite classification, from 25,957 tons in 1913 to 281,644 tons in 1926, can be credited to cast iron pipe.

American exports, expanded greatly by the war, fell off after 1922 and now seem to be much the same as in 1913. The change in the British position is attributable solely to smaller exports and increased imports of cast iron pipe. The United States likewise is importing more cast iron pipe than ever before, partly because the demand is good but mainly because French pipe is so much cheaper than domestic. The introduction of the centrifugal process may further strengthen the Continental position, though the saving will be less there than in this country, where wages are higher. Cheap iron—mostly high-phosphorous and hence free-running—is the main advantage of foreign foundries. At least one French plant is wholly self-contained, the iron in some cases being run molten direct to the molds from the blast furnaces.

The classification for *wire and wire products* includes exports of wire rods, which are reported separately for Belgium and for France, with a dwindling quantity from the United States. Besides wire, it also includes fencing, nails, bolts and nuts, rivets and tacks, along with woodscrews and a few other items commonly associated with wire products. The slight overlap with "sundries," however, is immaterial.

Exports in this group from the United States have fallen off, and the improvement in the trade, which became more marked in 1926 than in 1925, comes wholly from France and Belgium. The figures are swelled a little by the fact that England's larger purchases of wire rods are virtually counted twice, but this situation is balanced more or less by the reduction in imports into Belgium from Germany, which nevertheless have more than regained their pre-war position.

Table III.—Distribution of Exports of Finished Steel
[Based upon Monthly Average Exports from the Six Leading Countries, in Thousands of Metric Tons]

Commodity	1913 Quantity	1913 Per Cent	1925 Quantity	1925 Per Cent	1926 Quantity	1926 Per Cent
Bars, iron and steel	158.7	15.4	177.0	18.9	201.5	18.7
Shapes	104.7	10.1	67.6	7.2	90.2	8.4
Plates and sheets (a)	133.1	12.9	124.5	13.3	170.3	15.8
Tin plate	48.3	4.7	56.9	6.1	56.4	5.2
Galvanized sheets	79.3	7.7	78.9	8.4	73.9	6.8
Rails	142.9	13.8	89.9	9.6	112.8	10.4
Pipes and fittings	84.2	8.2	81.5	8.7	93.5	8.7
Wire and wire products	77.4	7.5	81.2	8.6	98.3	9.1
Sundries	202.7	19.7	179.6	19.2	183.0	16.9
Total	1,031.3	100.0	937.1	100.0	1,079.9	100.0

(a) Includes also hoops, bands, strips, etc.

As nearly as can be told from the statistics, the net increases as shown for all countries have been well distributed among the various finished products, except barbed wire.

Increases in Finished Goods

Changes in the nature of exports for each class of products and for each of the leading countries are shown in Table II. The comparison is between 1913 and 1925. Because of the abnormal features introduced by the British coal strike last year, a comparison with 1926 is of little real value—particularly when, as in the present analysis, no allowance is made for imports into the exporting countries themselves. In fact, most of the semi-finished steel exports are consumed by one or another of the leading countries. Hence they do not represent any appreciable *net* export and, even for some of the more highly finished products, substantial deductions might be made to allow for imports by the same countries.

The outstanding feature brought out by Table II

Table IV.—Comparison of Export and Home Trade of United States in 1925
(Annual Figures in Gross Tons)

Commodity	Gross Tons: Exports	Gross Tons: Home (a) Consumption	Per Cent of Total: Exports	Per Cent of Total: Home (a) Consumption	Exports as Percentage of Production
Bars, iron and steel	141,600	6,200,000	8.6	19.5	2.2
Shapes	181,200	3,600,000	11.0	11.5	4.9
Plates and sheets, black (b)	255,600	6,850,000	15.5	21.5	3.7
Tin plate	160,800	1,500,000	9.8	4.5	9.7
Galvanized sheets	160,800	1,000,000	9.8	3.0	13.2
Rails	151,200	2,800,000	9.2	9.0	5.4
Pipes and fittings	272,400	3,200,000	16.5	10.0	7.6
Wire and wire products	122,400	3,100,000	7.4	10.0	4.3
Sundries	201,600	3,450,000	12.2	11.0	4.8
Total	1,647,600	31,700,000	100.0	100.0	4.9

(a) Production figures of American Iron and Steel Institute plus imports less exports, supplemented (for certain items) by consumption estimates published in THE IRON AGE, Jan. 7, 1926.
(b) Includes also hoops, bands, strips, etc.

is the increasing proportion of finished goods in the exports, particularly in those from Great Britain and the United States, which countries, it should be noted, have begun to import more and more heavy products. The backbone of the United States outgoing trade is sheet products, but with a substantial contribution of wire and tubular goods. For British exports, although they are more diversified, the trend is definitely toward more finished steel. But even the Continental countries of Europe are expanding their shipments of finished material.

Without attempting to catalog the causes for this tendency, attention may be called to the relatively high cost of transporting American steel from mill to port, as well as the much greater burden of freight for assembling the requisite raw materials. While Great Britain, notwithstanding the recent increase from 50 per cent to about 60 per cent over pre-war railroad tariffs, is not similarly handicapped by internal freight charges, it is forced to import Continental semi-finished steel so long as the latter is so much cheaper.

Table III, which shows the distribution of world exports of finished steel, only serves to show the declining importance of heavier finished goods like rails and shapes, and the increasing importance of tin plate, galvanized sheets, wire products and other more costly items. It also shows the increased shipments of bars, which circumstance, since bars are relatively bulky articles, is contrary to the general trend.

Table IV, which develops the differences in character between American home and export trade, fur-

ther emphasizes the special importance of highly finished goods in our own exports. Thus bars, which in 1925 formed 19 per cent of home sales, formed only 8.6 per cent of the exports of rolled steel. The ratio of sheet products—and more particularly tin plate, galvanized sheets and black plate—to the total is higher for foreign than for domestic sales, and the same is true of wrought pipe. The difference would be even more clearly brought out if the large shipments to Canada and other nearby markets were eliminated.

This tendency to export steel of high rather than low unit value is continued forward into the manufacture of hardware, machinery, cash registers, typewriters and automobiles. In effect, it is the export of labor. Orthodox economics has commonly applied this principle to overcrowded countries like Italy and Japan, but it must be extended nowadays to the United States and, though to a less extent, to England, because of the use of power. Muscular metallurgy has given way to machines and—what is still more important—to highly perfected productive organizations in steel rolling mills, as well as in automobile factories and machine shops.

For a time, the equipment of American blast furnaces and steel works was so superior to that in foreign countries that it balanced the handicap of long hauls and high wages. But European countries have copied many of these improvements. The former difference in basic equipment no longer exists to quite the same extent. In all the leading competing centers, and even in India and Australia, many plants compare favorably with the best we have in the United States.

As the facts of geography and the ubiquitous influences of low-paid but reasonably efficient labor are more and more reflected in producing costs, American exporters, to compete successfully in world markets, are developing their trade in specialties, mostly items which, like tin plate and galvanized sheets, are of a less bulky nature and which, due to the magnitude of our home demand, can be made in tremendous volume.

Sharp Decline in Foundry Equipment Sales

July sales of 18 members of the Foundry Equipment Manufacturers Association, at $330,099, showed a decline of 35 per cent from the total of $507,834 for the previous month. The July figure was also 2½ per cent smaller than that for the same month last year.

Shipments in July, at $460,748, showed a loss of 17 per cent as compared with those for June, which totaled $555,805. They also showed a decline of 7 per cent from the total for July, 1926. Orders on hand Aug. 1, at $731,649, were 2 per cent larger than on July 1.

Iron Production in Australia and New Zealand

According to statistics of all metals compiled by the Australian Mines and Metals Association at Melbourne, and dated May, 1927, production of iron ore and pig iron is as follows, in gross tons:

Year	Iron Ore	Pig Iron	Year	Iron Ore	Pig Iron
1926.....	740,649	438,698	1920.....	605,626	344,000
1925.....	738,686	439,419	1919.....	437,260	253,755
1924.....	719,279	416,050	1918.....	416,302	209,253
1923.....	557,941	329,803	1917.....	449,860	148,419
1922(strike)	169,487	83,533	1916.....	324,144	127,591
1921.....	689,275	352,365	1915.....	417,744	146,532

The ore comes from deposits in New South Wales and South Australia, 75 per cent from the latter state, and all of the pig is made in the former state at two works—the Broken Hill Proprietary at Newcastle and Hoskins Iron & Steel Co. at Lithgow, but the latter is moving its works to Port Kembla, near coal.

Pig Iron Made in New Zealand

In the *Weekly News* (Auckland) for June 2, 1927, there was a picture of the loading of pig iron produced at the Onakaka Iron & Steel Co.'s plant in the Nelson district, northwestern part of the South Island, for export to Australia. This is an interesting item of news as it is the first shipment from a relatively new furnace to Australia, and a new industry in New Zealand, which country absorbs 11,000 tons of pig iron a year, also a total of 80,000 tons of steel rails, bars and wire.

According to a paper by J. A. Heskett in the *Proceedings* of the Dominion Mining Conference held at Dunedin early in 1926, the Onakaka (Maori name) company has 20,000,000 tons of 30 to 40 per cent iron ore, with 12 per cent silica and 12 per cent moisture. The current ore contains 50 per cent iron. Limestone is available nearby. The ore and limestone are quarried, crushed to 2½ in., and fed with beehive coke (89 per cent fixed carbon) made from New Zealand coal into the blast furnace. This is 55 ft. in height and has a hearth 5 ft. in diameter. A foundry iron is produced and is run into a casting machine. Steam from waste-heat boilers and Pelton water wheels are used for driving machinery. A well-equipped laboratory makes regular analyses of raw materials and products.

Ohio Foundry Operations Decline

July operations of members of the Ohio Foundrymen's Association declined to 72.3 per cent of normal from 84 per cent in June. The figure for July, 1926, was 76 per cent. The output of the foundries reporting was 10,761 tons, as compared with a normal melt of 14,864 tons.

Stocks received in July declined to 63.5 per cent of normal, the June figure being 83 per cent. In July, 1926, stocks received represented 56 per cent of normal. Stocks on hand Aug. 1 equaled 94 per cent of normal, as against 99 per cent one month previous and 79 per cent on Aug. 1, 1926.

July operations in non-ferrous foundries declined to 69 per cent from 78 per cent in June. In July one year ago the figure was 72 per cent.

Industrial Progress of the United States

Commerce Year Book—1926 has been issued by the Department of Commerce. Volume I covering the United States is already out, while Volume II (foreign nations) will be available about Oct. 1. The first volume is priced at $1. It comprises 676 pages, with a large number of graphs and a profusion of tabular matter covering manufacture, construction, metals and machinery, mining, transportation, banking, agriculture, foreign trade, prices, employment, and a great variety of other subjects pertinent to its title. In most cases the data are given for 1926, with comparisons of previous years, some of them running back half a century, but mostly beginning with the immediate prewar years.

The use of treated wood block floors in the United States in 1926 showed an increase of 17 per cent over the previous year, according to figures prepared by the United States Forest Service in cooperation with the American Wood-Preservers' Association. A total of 10,822,518 sq. ft. of these blocks were laid, the preservatives being creosote oil and creosote coal-tar paving oil.

MACHINE TOOL CONGRESS

New Organization to Hold First Meeting During Cleveland Machine Tool Exposition

A FORUM to be known as the Machine Tool Congress and to be open to those interested in discussing problems of mutual interest to users, distributers, designers and builders of machine tools will hold its first meeting at Cleveland, Sept. 19-22, during the exposition of the National Machine Tool Builders' Association. Those for whom the forum is intended include men who are not members of engineering societies, but who have something to contribute and to receive from discussions in a neutral forum the only qualification for membership in which is a reasonable interest in machine tools.

Standardization: Various Points of View to be Discussed

The central topic for discussion at the first meeting will be "Various Phases of Standardization of Machine Tools." This question will be discussed, first, from a broad aspect of standardization in general, and its benefit to the industry. This phase of the subject will be presented by Dr. P. G. Agnew, secretary American Engineering Standards Committee, New York. Another discussion, to be led by James E. Gleason, president Gleason Works, Rochester, N. Y., and president of the National Machine Tool Builders' Association, will set forth the advantages of standardization from the machine tool builder's point of view. Standardization from the engineering point of view will be dealt with by Sol A. Einstein, chief engineer Cincinnati Milling Machine Co., Cincinnati, and another speaker of prominence will present a discussion of the standardization of machine tools from the user's point of view.

Other sessions of the congress will be in the nature of round table discussions of specific items concerning machine tools, which would be proper subjects for standardization. As a tentative list the following nine items have been suggested: Standardization of initial speeds of machine tools; of spindle ends of engine lathes, screw machines and grinding machines (this to include face plates and chucks); of belt pull; of spline shafts; and of paint colors and materials for finishing. Other suggested items are the urging of standardization of certain fundamental dimensions of motors, pumps and other purchased units for machine tools; discussion of the use of flange motors as compared with the usual motor with feet; standardization of hand wheels, pulleys, bushings, etc., and in general the question of standardizing of parts as compared with practices; and discussion of the standardization of working ranges, nomenclature, etc.

Reduced rates on the certificate plan of one and one-half fares for the round trip have been granted by the railroads to those who take membership in this congress, either before or during the sessions, and who provide themselves with certificates under the usual rules laid down. The secretary pro-tem of the congress is E. F. DuBrul, general manager of the National Machine Tool Builders' Association, Provident Bank Building, Cincinnati.

Technical Papers for Automotive Engineers' Production Meeting

The technical program for the sessions of the production meeting of the Society of Automotive Engineers to be held at Cleveland and at Detroit is announced as follows:

Cleveland Sessions—Hotel Winton

MONDAY, SEPT. 19

9.00 *a. m.—Opening Session—E. P. Blanchard, Chairman.*

"Net Profit from Modern Machine Tools," by George T. Trundle, Jr., Trundle Engineering Co.

"Manufacturing Methods Used in Building the Wright Whirlwind Engine," by Lee M. Beatty, Wright Aeronautical Corporation.

7.30 *p. m.—Evening Session—W. G. Careins, Chairman.*

"Non-Productive Materials," by D. W. Ovaitt, efficiency engineer Buick Motor Co.

"Integrated Production," by E. P. Blanchard, Bullard Machine Tool Co.

TUESDAY, SEPT. 20

9.00 *a. m.—Machine-Tool Session—K. H. Condit, Chairman.*

"Application of Electric Motors to Machine Tools," by R. C. Deale, Niles-Bement-Pond Co.

"Developments in Cylinder Grinding," by M. C. Hutto, Hutto Engineering Co., Inc.

"Processes Used in Making Stones," by P. H. Walker, ceramic engineer Carborundum Co.

A demonstration of a tamping machine for obtaining uniform hardness of stones will follow this paper.

"External Grinding," by L. A. Becker, chief engineer A. P. Schraner & Co.

6.30 *p. m.—The Stag Carnival—Rainbow Room—Hotel Winton.*

Detroit Sessions—Hotel Statler

WEDNESDAY, SEPT. 21

2.00 *p. m.—Steel Session—Frank P. Gilligan, Chairman.*

"Relation of Metallurgy to Production," by J. M. Watson, metallurgist Hupp Motor Car Corporation.

"Frequency Curves as a New Basis for S. A. E. Physical-Property Charts," by E. J. Janitzky, metallurgical engineer, Illinois Steel Co.

"Developments in Grinding," by O. A. Knight, Norton Co.

8.00 *p. m.—Evening Session—John Younger, Chairman.*

"Production Engineering," by A. R. Glancy, president Oakland Motor Car Co.

"Fire Hazards Incidental to the Spraying of Inflammable Finishes," by H. E. Miner, E. I. du Pont de Nemours & Co.

The motion picture, "The Age of Speed," will be shown following the second paper.

THURSDAY, SEPT. 22

7.30 *p. m.—Time-Study Session—Eugene Bouton, Chairman.*

"Relation of Time-Study to Management," by J. C. Mottashed, Hudson Motor Car Co.

"Relation of Time-Study to Labor Budgets," by E. J. Frounfelker, Continental Motors Corporation.

The three sessions at Cleveland are in conjunction with the first exhibition of the National Machine Tool Builders Association and the Detroit meetings are to be held at the same time as the technical sessions and the exposition of the American Society for Steel Treating, as in the last few years.

Wisconsin Gray Iron Research Group to Meet

The fifth regular monthly meeting of the Wisconsin Gray Iron Research Group will be held at the Republican House, Milwaukee, on Wednesday evening, Sept. 7. A dollar dinner will be served at 6.30 p.m. The speaker of the evening will be Charles J. Scullin, manager of the technical service department, St. Louis Gas & Coke Corporation. Mr. Scullin will discuss "Cupola Practice."

Stainless Steel for Electric Welding

A well-known English commercial weekly newspaper recently published an article entitled "Alloy Steel-Welding Electrodes," in which it was declared that welding stainless steel calls for special care on the part of the operator because the thermal conductivity of the stainless steel is very low. Correct adjustment of the current and extra care, it was said, were decidedly essential if a successful weld was to be made.

Exception has been taken to this statement by Brown, Bayley's Steel Works, Ltd., and T. Hagon, a director of this well-known steel manufacturing concern, has issued a statement in which he says that low thermal conductivity does not apply to stainless steel alone, but to all alloy steels. Mr. Hagon points out that in the case of stainless steel, the slight disadvantage arising from the low thermal conducivity is more than compensated for by the lower melting point.

Consumption of babbitt metal in July is reported by the Department of Commerce at 4,604,786 lb., the smallest amount for any month this year and smaller than for any of the first seven months of the two preceding years. This is based on returns from 31 firms. Sales by manufacturers accounted for about two-thirds of the total, with 3,162,325 lb. Consumption by producers was 1,442,461 lb. Total consumption for the first seven months at 35,735,478 lb. was about 10 per cent below the first seven months of last year, with 39,714,243 lb.

Machinery Markets and News of the Works

BUSINESS CONTINUES SLOW

Machine Tool Buying Shows Little, If Any, Improvement

Miscellaneous Purchases Mostly Made up of Single Machines — Inquiries are Not Numerous

AUGUST machine tool business, with the exception of certain large export orders recently placed, will show little, if any, improvement over that of July. Inquiries are not numerous, but a good deal of pending business that was considered active prior to the summer season is still to be decided upon, and the machine tool trade looks to a picking up in the volume of buying soon after Labor Day. A large attendance of buyers is expected at the National Machine Tool Exposition in Cleveland the week of Sept. 18, and it is known that many of them are holding in abeyance any buying they may have in prospect until they see the new and improved machines that will be exhibited there.

Current business consists almost entirely of orders for single machines. One of the larger orders of the week was for 10 deep-hole drilling machines placed by a Detroit automobile company.

The Nash Motors Co., Kenosha, Wis., is indicating an interest in several tools. A Russian trading company with office in New York is still in the market for a few tools, following recent purchases. The International Harvester Co., Moline, Ill., is in the market for several squaring shears. The New York Central will take prices on three grinding machines.

Agricultural machinery manufacturers are among the most active buyers in the Chicago district, and a sizable list from a Racine, Wis., plant is expected soon by the trade. Railroad buying is conspicuously small in volume.

New York

NEW YORK, Aug. 30.

WHILE there is evidence of slightly more interest in machine tool purchasing, actual business is still of small volume. New designs of tools to be exhibited at the National Machine Tool Exposition in Cleveland next month are awaited by many sellers as a means of stimulating buying interest. Current inquiries are mostly for single machines and consumers are slow to take action. A Japanese export house has been obtaining prices on a forging machine for shipment to Japan, and a Russian trading company is reported to be still in the market for a few tools, following several recent purchases. A Buffalo manufacturer has purchased a roll-grooving machine, a Detroit automobile manufacturer has closed on 10 deep-hole drilling machines, and the Northern Pacific Railroad has placed a 16-in. tool makers' lathe.

Following its recent purchase of the plant and business of the J. F. Webendorfer Co., Mount Vernon, N. Y., manufacturer of rotogravure printing machinery, the Harris-Seybold-Potter Co., 4510 East Seventy-first Street, Cleveland, manufacturer of automatic printing presses and kindred equipment, is said to be planning the early removal of the Mount Vernon plant to its branch at Derby, Conn., where additional facilities will be provided. The purchasing company comprises a previous merger early in January of the Harris Automatic Press Co., Cleveland; Seybold Machine Co., Dayton, Ohio; and the Premier & Potter Printing Press Co., New York. R. V. Mitchell is president. J. F. Webendorfer, heretofore head of the acquired company, will continue in charge of that division of the consolidated company.

The Board of Education, Union Free School District No. 1, Tuckahoe, N. Y., plans the installation of manual training in its new three-story high school at Tuckahoe Avenue and White Plains Road to cost $600,000, for which superstructure has begun. Tooker & Marsh, 101 Park Avenue, New York, are architects.

Max L. Epstein, 327 Fenimore Street, Brooklyn, plumbing and heating equipment and supplies, has filed plans for two four-story factories, 95 x 125 ft., to cost about $150,000. Tobias Goldstone, 26 Court Street, is architect.

The Yale Electric Corporation, 60 Tillary Street, Brooklyn, manufacturer of electric batteries, lamps, etc., has arranged for a stock issue to total $220,000, a portion of the fund to be used in connection with an expansion program, including a new plant at Jersey City, N. J., with ultimate cost placed at close to $750,000. It is purposed to remove the present Brooklyn works to the new location.

Contract for the machine tool equipment for maintenance work at the Schoharie Reservoir has been awarded by the New York City Board of Water Supply to the J. J. McCabe Lathe & Machinery Corporation, 149 Broadway, New York. The equipment consists of one McCabe 2-in-1 lathe, one large planer, one radial drill and a number of other tools.

The Union Railway Co., 2396 Third Avenue, New York, a subsidiary of the Third Avenue Railroad, same address, operating a system at White Plains, N. Y., has acquired property at Ridge and John Streets, White Plains, as a site for a new two-story automobile service, repair and garage building for its motor buses, to cost $150,000 with equipment.

Egleston Brothers & Co., Inc., 539 Borden Avenue, Long Island City, iron and steel products, has awarded a general contract to the Austin Co., New York, for a one-story addition to its works, for storage and distributing service, to cost more than $40,000.

The Saranac Products, Inc., Plattsburg, N. Y., lately organized by Oliver A. Quayle, Jr., 895 Warren Street, Albany, N. Y., and associates, is said to be planning the early operation of a local mill for the manufacture of paper goods.

The New York Central Railroad Co., 466 Lexington Avenue, New York, has plans under way for a two-story machine and repair shop at Dumont, N. J., 20 x 50 ft. The engineering department is in charge.

The Eagle Handle Co., 957 Savoye Street, North Bergen, N. J., manufacturer of umbrella handles, etc., has leased a one-story factory at Guttenberg, N. J., totaling about 5000 sq. ft. of floor space, and will remove to this location.

The Board of Education, Teaneck, N. J., plans the installation of manual training equipment in its proposed three-story high school, to cost $700,000, for which bids will soon be asked on a general contract. Hacker & Hacker, Fort Lee Trust Building, Fort Lee, N. J., are architects.

The Passaic Valley Sewage Commission, 20 Branford Place, Newark, N. J., is arranging an appropriation of $675,000 for work on its project during the next 12 months, and in accordance with recommendations of its chief engineer, J. Ralph Van Duyne, plans the early purchase of an industrial locomotive, gasoline or electrically operated, for use at its main pumping station; compressor and tank for the Second River yard; new air compressor at main pumping station; relief valves and exhaust piping, etc.

Adam Black & Sons, Inc., 53 Cambridge Avenue, Jersey City, N. J., manufacturer of automobile bodies, has awarded

a general contract to A. W. Crone & Son, 338 Palisade Avenue, for a one-story addition, to cost close to $40,000 with equipment. William Neuman, 40 Journal Square, is architect.

The Fyre-Freez Corporation, 17 West Forty-sixth Street, New York, has been organized as a subsidiary of the General Carbonic Co. to manufacture a special fire extinguisher operated with liquefied carbonic gas for quenching electrical and liquid fires. The company will not build a plant, but will utilize the facilities of the General Carbonic organization.

The Automatic Marker Co., Inc., 349 Broadway, New York, has been organized to manufacture marking devices for the garment trades. Contract for manufacture has been awarded, but the company is in the market for materials.

Philadelphia

PHILADELPHIA, Aug. 29.

PLANS have been filed by the Otis Elevator Co., Sixteenth and Sansom Streets, Philadelphia, for a three-story plant, 60 x 160 ft., to cost more than $150,000 with equipment. Headquarters are at Eleventh Avenue and Twenty-sixth Street, New York. W. O. Moyer is company engineer.

The Ballinger Co., Twelfth and Chestnut Streets, Philadelphia, architect and engineer, has plans for a two-story addition to the service, repair and garage building, 120 x 220 ft., of the Automobile Club of Philadelphia, Twenty-third and Ludlow Streets, to cost upward of $150,000.

The Pennsylvania Railroad Co., 15 North Thirty-second Street, Philadelphia, C. E. Walsh, purchasing agent, is asking bids until Sept. 8 for wire fencing and nails, contract 106; also for frogs and crossings, contract 105. Plans have been approved for a proposed addition to its car shops at Todd's Cut, Wilmington, Del., to be one-story, 160 x 230 ft., primarily for the repair and reconditioning of electric rolling stock and other electrical equipment to be used on the line between Philadelphia and Wilmington, now being electrified. The new unit will cost more than $250,000 with machinery.

The Philadelphia Rapid Transit Co., 810 Dauphin Street, Philadelphia, has plans nearing completion for extensions and improvements in its motor bus service, repair and garage building, to cost approximately $150,000.

The General Electric Co., Witherspoon Building, Philadelphia, has awarded a general contract to the United Gas Improvement Contracting Co., Broad and Arch Streets, for a one and two-story addition to its plant on Elmwood Avenue, to be 104 x 554 ft., to cost $400,000 with equipment. Harris & Richards, Drexel Building, are architects.

Thomas H. Livezey & Co., Third Street, near Butler Street, Philadelphia, manufacturer of drop forgings and other iron and steel products, plans to rebuild the portion of its plant destroyed by fire Aug. 23, with loss reported in excess of $45,000 with equipment.

Officials of the Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, are organizing the Susquehanna Utility Co., a new subsidiary, to operate in the vicinity of the Conowingo hydroelectric power project of the parent company, but having no direct interest in that development. The new company is concluding negotiations for the purchase of the Northern Maryland Power Co., operating at Port Deposit, Aberdeen, Havre de Grace and vicinity, and the Southern Pennsylvania Power Co., with properties at Oxford, Russellville, Nottingham, Pa., and neighboring sections. Extensions and improvements will be made in present power facilities and transmission lines. Other properties will be acquired. The parent company has acquired a tract of about 33 acres near the Trenton cut-off of the Pennsylvania Railroad, and is reported planning to use the site for a new power station.

The Reading Airways, Inc., Reading, Pa., recently formed by John P. Wolfinger, chairman of the aviation committee of the Reading Chamber of Commerce, and associates, has plans for a new airport at Ontelaunee, near the city limits, to include hangars, repair and reconditioning shops, and other buildings.

The Central Railroad of New Jersey, Jersey City, N. J., is planning the early construction of a one-story and basement power house at its shops at Bethlehem, Pa., to be 48 x 80 ft., to cost close to $50,000 with equipment.

Bids will soon be asked by the Arcadia Mills, 749 Pittston Street, Allentown, Pa., for a power house, 70 x 70 ft., to cost about $40,000 with equipment. Jacoby & Everett, Commonwealth Building, are architects.

The Board of Education, Altoona, Pa., plans the installation of manual training equipment in a proposed three-story junior high school, to cost about $425,000, for which plans will be drawn by Hersh & Shollar, Commerce Building, architects.

The Endura Mfg. Co., Eleventh Street and Washington Avenue, Philadelphia, manufacturer of heavy paper stocks, has work under way on extensions and improvements in the former mills of the Durham Paper Co., Durham, Pa., recently acquired, with installation of additional equipment.

The City Council, Sayre, Pa., will soon begin the construction of a municipal airport on a 200-acre tract, with hangars, machine and repair shops, oil storage facilities and other buildings. The entire project is reported to cost in excess of $60,000.

The Bear Oil Burner Co., York, Pa., Charles H. Bear, president, is planning for the manufacture of a new type of oil burner, recently invented by Mr. Bear, and will provide facilities for extensive production.

The Saylor Planing Mill & Lumber Co., Pottsville, Pa., has an expansion and improvement program under way to cost close to $75,000. A three-story building will be erected.

The Atlas Conveyor Co., 20 South Fifteenth Street, Philadelphia, has been organized to design and build elevators, conveyors, skip hoists, coal weigh larries, cable drag scrapers, ash hoppers, gates and kindred equipment for the handling and storage of coal, coke, ashes and other bulk materials. Associated with the new company are Percival K. Reed, L. G. Weygandt and E. A. Thumlert, all of whom were formerly connected with the R. H. Beaumont Co., Philadelphia.

The Peerless Heater Co., Boyertown, Pa., has consolidated its general offices and manufacturing plant by the removal of the offices from 5602 Baum Boulevard, Pittsburgh, to the factory at Boyertown.

The John Wood Mfg. Co., Conshohocken, Pa., will establish a branch plant at Oakland, Cal., to manufacture household water tanks. Frank Sutcliffe, president of the company, has returned from a trip to the Pacific Coast, where he leased a site for the plant.

New England

BOSTON, Aug. 29.

AUGUST will close as one of the leanest months experienced this year by machine tool dealers. A small number of used tool houses, however, claim that it will be a better month than July, but these dealers were inactive last month, while some new tool houses were comparatively busy. It is the opinion of the trade, however, that September will be a better month than either July or August. Sales the past week included a used two-spindle Leland drill to a Boston shop, a used Napier band saw to a Rhode Island plant, a used Leland & Gifford profiler to a Massachusetts plant, a used La-Pointe broaching machine to another Massachusetts shop, two new 14-in. lathes to greater Boston shops, and a power and a hand press to small companies in the Cape Cod district. Small tool sales the past week have taken a decided drop. It is believed, however, that many shops must replace a considerable amount of equipment.

The Remington Typewriter Co., Bridgeport, Conn., will build a four-story, 60 x 70 ft., addition.

The Board of Contract and Supply, Providence, R. I., James E. Dunne, mayor and chairman, is taking bids for a pumping station on Bath Street.

The Westinghouse Electric & Mfg. Co., Springfield, Mass., will begin operations at its new Chicopee, Mass., plant on Sept. 5. The company has recently closed a Government radio transmitter order.

The Pollak Tool & Stamping Co., 81 Freeport Street, Neponsit district, Boston, manufacturer of buffing equipment, is making alterations to its plant and will install new metal-working equipment.

The Hemming-Walsh Mfg. Co., New Haven, Conn., manufacturer of cutlery, has purchased the plant of the Holmes Mfg. Co., Shelton, Conn., and will concentrate operations there. The company has under consideration the purchase of machine tools.

The city of New Bedford, Mass., is making repairs and alterations to its fire department repair shop. Edwin F. Dahill is chief of the department. C. Hammond & Co., North Water Street, are the architects.

The Boston Ice Co., 110 State Street, Boston, is taking bids for a one-story, 100 x 179-ft. ice house, for which conveying machinery is required. Leslie Weir, 41 East Forty-second Street, New York, is the architect.

The Boston & Albany Railroad will erect a new power plant, 50 x 114 ft., 80 ft. high, at its shops at West Springfield, Mass., to cost, with equipment, approximately $450,000. A 475-ton overhead coal bunker is included for which conveying equipment is required.

The Strathmore Paper Co., Woronoco, Mass., is making repairs and an addition to its machine room. Paper-making machines are to be enlarged and a traveling crane installed.

The Package Machinery Co., Springfield, Mass., has

The Crane Market

A SLIGHT improvement in the volume of inquiry for overhead cranes is reported but the locomotive crane field is still quiet, except for some activity in used equipment. A number of purchases of overhead cranes have been made in the past week. Among pending inquiries are the cranes for the New York Central Railroad including a 10-ton overhead for Buffalo.

Among recent purchases are:

Nazareth Cement Co., Nazareth, Pa., a 20-ton, 42-ft. span, 3-motor overhead crane from the Cleveland Crane & Engineering Co.

F. L. Smidth & Co., 50 Church Street, New York, a 7-ton hand power crane for the Missouri-Portland Cement Co. from an unnamed builder.

Harris Structural Steel Co., 1440 Broadway, New York, two 7½-ton, 34-ft. span and one 10-ton, 70-ft. span overhead crane for New Market, N. J., from a western builder.

United States Cast Iron Pipe & Foundry Co., Burlington, N. J., a 10-ton overhead crane for Addyston, Ohio, from a western builder.

Compressed Spruce Products Co., West Orange, N. J., a 3-ton capacity transfer crane with electric hoist from H. D. Conkey & Co.

A. T. Petrillo, stoneyard, Mount Vernon, N. Y., a 5-ton, 26-ft. span electric crane from the Northern Engineering Works.

Power Corporation of New York, Watertown, N. Y., one 40,- one 30- and one 20-ton electric crane from an unnamed builder.

Decorative Stone Co., New Haven, Conn., a 2-ton, motor driven, overhead crane from H. D. Conkey & Co.

National Radiator Co., Cleveland, a 1½-ton, motor driven, overhead crane from H. D. Conkey & Co.

W. F. & John Barnes Co., Rockford, Ill., a 5-ton hand power crane from H. D. Conkey & Co.

Frost Mfg. Co., Galesburg, Ill., a 3-ton hand power jib crane from H. D. Conkey & Co.

General Motors Truck Co., Pontiac, Mich., a 5-ton, motor driven, overhead crane from H. D. Conkey & Co.

American Steel & Wire Co., Pittsburgh, a 1-ton, 12-ft. span, hand power crane from H. D. Conkey & Co.

Jones & Laughlin Steel Corporation, Pittsburgh, a 5-ton, 75-ft. span, electric overhead crane for its Hazlewood warehouse station from the Shaw Electric Crane Co.

Central Alloy Steel Corporation, Canton, Ohio, two 10-ton, 77-ft. span overhead traveling cranes for its Berger division from the Morgan Engineering Co.

E. Keller Co., Williamsport, Pa., a used 10-ton, 50-ft. span, overhead crane from T. B. MacCabe, Philadelphia.

Thompson Wire Co., Worcester, Mass., a used 5-ton, 30-ft. span, overhead crane from T. B. MacCabe, Philadelphia.

McCarter Iron Works, Norristown, Pa., a used 10-ton, 30-ft. span, overhead crane from T. B. MacCabe.

awarded contract for an extension to be used for the assembling of large machinery. A crane will be installed.

The plant and equipment of the New England Enameling Co., Middletown, Conn., manufacturer of aluminum, galvanized and tinware kitchen utensils and vending machines, will be sold at a receiver's public auction Sept. 7 and 8 by the Industrial Plants Corporation, 25 Church Street, New York. The land and buildings will be offered as a unit and all machinery and equipment will be offered separately. The list includes power presses, motors, engines, tool room equipment, full sets of dies for manufacture of hollow ware kitchen utensils, completed vending machines with dies, tools and parts, enamel grinding mills and furnaces, belting, shafting and scrap iron.

Mac Grossman, representative in the New England territory for the Reading Foundry & Supply Co., Reading, Pa., manufacturer of plumbing, heating and tinners' supplies and sanitary fixtures, has removed his headquarters from 1090 Eastern Parkway, Brooklyn, to 124 Selden Street, Dorchester, Mass.

The Stamford Rolling Mills, Springdale, Conn., manufacturer of brass products, has had plans drawn by Fletcher-Thompson, Inc., 542 Fairfield Avenue, Bridgeport, Conn., architect and engineer, for a one-story addition, 112 x 215 ft., to cost upward of $75,000. It will replace a unit recently destroyed by fire.

The F. L. Mills Co., 2316 Fairfield Avenue, Bridgeport, Conn., is completing plans for a new one-story automobile service, repair and garage building, 100 x 200 ft., to cost about $115,000 with equipment. Fletcher-Thompson, Inc., 542 Fairfield Avenue, is architect and engineer.

The Holyoke Paper Mfg. Co., Holyoke, Mass., is said to be considering the purchase of the Oakdale Mills of the American Writing Paper Co., Manchester, Conn., which have been placed on the market, for the manufacture of a line of paper products under a special process. It is purposed to remodel the plant and install additional equipment. The entire project is estimated to cost $200,000. The Manchester Chamber of Commerce is interested in the enterprise, with view to securing local financial support to insure the project.

The New England Concrete Pipe Corporation, Boston, care of Henry C. Eames, 275 Tremont Street, recently formed with capital of $100,000 by Mr. Eames and associates, has acquired a tract of 8 acres between Highlands and Upper Falls, Newton, Mass., as a site for a new plant for the manufacture of cast concrete pipe. The initial unit will be 150 x 200 ft., with several smaller buildings, and is reported to cost in excess of $50,000 including equipment. Mr. Eames will be treasurer of the new company, and Stuart G. Rutherford, president.

The Northern Ply Wood Co., Houlton, Me., care of Lewis A. Burleigh, Augusta, Me., chairman of the board, recently chartered under State laws with a capital of $250,000, has plans under way for the erection of a new mill for the production of ply veneer cases and containers. A site has been selected and tract of about 10,000 acres of hardwood timberland in northern Maine acquired. The initial plant is estimated to cost more than $100,000 including machinery. Thomas R. Winchell will be president of the new organization.

The United Electric Power Co., Providence, R. I., is arranging for a bond issue of $27,750,000, and stock issue of 421,492 shares, a portion of the proceeds to be used for expansion. The company will also purchase the Narragansett Electric Light Co., operating in the same city.

The Worcester Wire Works, Inc., Worcester, Mass., has awarded a contract to Bylund Brothers, Worcester, for a one-story addition.

The American Brass Co., West Main Street, Waterbury, Conn., has filed plans for a one-story addition, 60 x 110 ft.

South Atlantic States

BALTIMORE, Aug. 29.

CONTRACT has been let by the National Enameling & Stamping Co., 1901 Light Street, Baltimore, to the McClintic-Marshall Co. for a one-story addition to cost close to $60,000.

The Board of District Commissioners, District Building, Washington, is asking bids until Sept. 12 for laundry machinery for an institutional building at Blue Plains, D. C.

C. M. Guest & Son, Anderson, S. C., contractors, have inquiries out for a 50 to 75-kva. electric generator, 60-cycle, 3-phase, with accessories; also, for a bucket and hopper, with wood tower, and 35 to 50-hp. induction type electric motor.

The Davis Instrument Mfg. Co., 112 West Fayette Street, Baltimore, manufacturer of scientific instruments, has leased a new factory to be erected on Thirty-sixth Street, near the Old York Road, one-story, 35 x 100 ft. It is purposed to remove the present plant to the new location and provide additional equipment for increased output. James Nussear, 9 East Pleasant Street, is architect.

The Richmond Storage & Service Garage, Inc., Richmond, Va., recently organized, is completing plans for the early erection of a multi-story service, repair and garage building, to cost in excess of $200,000 with equipment.

Motors, power equipment, conveying and other machinery will be installed in the addition to be constructed by the *Baltimore Sun*, 4-6 Redwood Street, to cost $200,000, including improvements in present plant. Willis & Lambkin, 513 North Charles Street, are architects.

William Gordon Beecher, 12 East Pleasant Street, Baltimore, architect, has plans under way for a power house for a company whose name is temporarily withheld, estimated to cost $150,000 with equipment.

The Trent Mills, Inc., Pollocksville, N. C., has begun rebuilding its local cottonseed oil mill and plans the installation of new equipment, including belting and transmission apparatus.

The Bureau of Water Supply, Baltimore, has secured an appropriation of $75,000 from the Board of Estimates for

a new pumping plant for the city waterworks in the Guilford district. Plans will soon be drawn and machinery purchased.

The Champan-Storm Lumber Co., Holly Hill, S. C., has inquiries out for a 10-ton locomotive crane and 10-ton steel derrick.

The City Council, Augusta, Ga., is completing plans for the establishment of its proposed Daniel airport, to include the erection of hangars, machine repair and reconditioning shops, oil storage and distributing buildings, and other facilities. Frank M. White, 1222 Troupe Street, is engineer.

The Gaston County Dyeing Machine Co., Mount Holly, N. C., manufacturer of dyeing machinery, is said to have plans under way for a new one-story plant, to cost about $45,000 with equipment.

R. P. Johnson, Wytheville, Va., machinery dealer, is making inquiries for a standard gage locomotive, gasoline-operated; also for one horizontal return tubular boiler, 200 hp., to operate at 130 lbs. working pressure.

The Board of Crisp County Commissioners, Cordele, Ga., has engaged Emmett S. Killebrew, Albany, Ga., consulting engineer, to prepare plans for its proposed new hydroelectric generating plant on the Flint River, near Cordele, to develop a capacity of 18,000 hp., to be used primarily for industrial service. The entire project with power dam and transmission lines is estimated to cost upward of $1,000,000.

Plans are being arranged by Wilson M. Hardy, president Hardy Trust Co., Rome, Ga., and associates, for the organization of a company to establish and operate a plant for the manufacture of electric stoves and kindred equipment. It is proposed to begin operations soon.

The Board of Trustees, Maryland Training School for Boys, Loch Raven, Md., has approved plans for the construction of a new power plant and mechanical laundry to cost in excess of $100,000 with equipment. Hopkins & Burton, 347 North Charles Street, Baltimore, are architects.

The Board of Public Works, Lancaster, S. C., W. R. Moore, chairman, is asking bids until Sept. 27 for an elevated steel tank, 150,000 to 200,000 gal. capacity, on steel tower, for the municipal water system. The H. S. Jaudon Engineering Co., Lancaster, and Elberton, Ga., is engineer.

The Hackley-Morrison Co., Inc., 204 North Jefferson Street, Richmond, Va., machinery dealer, has inquiries out for a 15-ton locomotive crane, 8-wheel type, 50-ft. boom, with 1-yd. bucket capacity, double drum; also for a power saw, motor-driven, and a jaw crusher, 20 to 24-in. jaw capacity, for use with tailing crusher in a lime works.

The Equipment Sales Co., dealer in machinery and equipment, formerly located at Nashville, Tenn., has concentrated its general offices in the Richmond Trust Building, Richmond, Va. The company also maintains selling and warehouse facilities at Benson Mines, N. Y.

Milwaukee

MILWAUKEE, Aug. 29.

WHILE machine tool sales still lack volume, conditions affecting the industry are improving steadily with the general betterment of foundry and machine shop business. Inquiry is generally reported as improving and prospects for the fall and winter are believed to be promising.

The Pine-Ihrig Co., Oshkosh, Wis., manufacturer of special machinery, contemplates the enlargement of its shops, but no details have been settled upon. It has established a new department for the manufacture of printing presses, taking over the business of Cyrus McCain, inventor and patentee of high speed automatic cylinder presses, who has joined the organization as department manager. Some additional equipment is being purchased for the present shop and a considerable list is in prospect when the plant is enlarged. E. W. Ihrig is president and general manager.

The Logemann Brothers Co., 3128 Burleigh Street, Milwaukee, manufacturer of scrap metal baling presses, has plans by Eugene R. Liebert, architect, 49 East Wells Street, local, for the construction of a one-story machine shop addition, 50 x 200 ft. With equipment the investment will be approximately $60,000.

The Superior Metal Products Co., Kenosha, Wis., and the Kenosha Plating Co. have merged their interests and moved into new quarters in the former plant of the Specialty Brass Co., at 2219 Sixty-ninth Avenue, Kenosha. The consolidated companies take the name of the Superior concern. Some new equipment is being purchased.

The Common Council of Oconomowoc, Wis., closes bids Sept. 9 for the complete construction and equipment of a municipal sewage disposal plant, which will require one vertical shaft motor-driven sewage pump with starter and float switch, one 100-gal. per min. water pump, one dry chemical feed machine with motor, starter, mixing tank, solution pump and base, one 35-ft. clarifier with motor, reduction gears, etc. The engineer is W. G. Kirchhoffer, Madison, Wis. Alex Stemper is city engineer.

John T. Ellison, 528 Summit Avenue, Milwaukee, is having plans made by Rosman & Wierdsma, architects, 490 Broadway, local, for a three-story automotive community building, 375 x 450 ft., on Wisconsin Avenue, from Thirty-sixth to Thirty-seventh Streets. The entire sub-floor will be divided into machine shops and service stations for tenants. The cost is estimated at $750,000.

The Northwestern Iron & Metal Co., 928 Garfield Avenue, Racine, Wis., suffered a heavy loss by fire in its scrap metal warehouse and handling plant on Aug. 23. Rebuilding will begin at once. Maurice Silverman is manager.

The Wisconsin Power & Light Co., 16 North Carroll Street, Madison, Wis., has started construction work on a new $250,000 hydroelectric generating plant on the Wolf River, near Shawano, Wis. The contract for the turbine has been let to the Allis-Chalmers Mfg. Co., Milwaukee, and the General Electric Co. will furnish the generator and switchboards. E. J. Kallevang is chief engineer.

The Common Council, Wauwatosa, Wis., has appropriated $33,000 for the construction and equipment of a municipal garbage incinerating plant and expects to take bids shortly for the reduction furnaces.

The City Water and Light Commission, Fort Atkinson, Wis., is about to ask bids for furnishing and installing two 750 gal. per min. centrifugal motor-driven pumping units for the city water plant. W. D. Leonard is chairman.

John Schneiberg, 947 Bluff Street, Beloit, Wis., is low bidder at $111,980 for the erection of the first unit of the new Beloit Vocational School, 153 x 160 ft., part two stories and basement, designed by Merman & Skogstad, architects, LaCrosse, Wis. The unit will cost $225,000 complete. D. Arnold is secretary of the Board of Industrial Education.

The Board of Education, Baraboo, Wis., expects to call for bids about Sept. 10 or 15 for the construction of a new $250,000 high and vocational school, designed by Claude & Starck, architects, Madison, Wis. E. P. McFetridge is president of the board.

The Waukesha County Board, Waukesha, Wis., will soon be in the market for miscellaneous equipment for a new machine and service building, 50 x 120 ft., one story, to accommodate its fleet of trucks and other highway construction and maintenance equipment. August Schumacher is chairman.

The Moloch Co., Kaukauna, Wis., has completed the rebuilding of its foundry destroyed by fire several months ago, with a loss of over $100,000.

Detroit

DETROIT, Aug. 29.

PLANS are under way for a group of four plant units for the Boydell Brothers White Lead & Color Co., 432 East Lafayette Street, Detroit, to cost in excess of $100,000 with equipment. Halpin & Jewell, Hammond Building, are architects.

I. M. Lewis, Congress Building, Detroit, architect, has plans for a new three-story automobile service, repair and garage building, to cost more than $200,000 with equipment.

The Higgins Brass Mfg. Co., 12435 Dequindre Street, Detroit, is arranging for the erection of a new one-story plant, 80 x 190 ft., to cost upward of $50,000 with equipment.

The Electric Refrigeration Corporation, Buhl Building, Detroit, is arranging for a stock issue to total about $2,875,000, a portion of the fund to be used for general expansion.

Ovens, power equipment, conveying and other machinery will be installed by the Schulze Baking Co., 6044 Fourteenth Street, Detroit, in connection with rebuilding the portion of its plant destroyed by fire Aug. 14, with loss close to $100,000.

The Hanchett Swage Works, Big Rapids, Mich., is expanding production at its plant and will devote a considerable portion of output in the future to a new line of heavy type side surface grinders.

The Calumet & Hecla Consolidated Copper Co., Calumet, Mich., is said to be planning the early installation of a new smelting furnace at its plant at Hubbell, Mich., additional casting machinery and other equipment. The expansion will cost in excess of $200,000.

The Yeager Bridge & Culvert Works, Port Huron, Mich., will expand its steel fabricating and metal-working plant in connection with rebuilding a portion of the property recently destroyed by fire. It is purposed to provide a structure close to three times the size of former unit, with installation of machinery for similar increase in output.

The Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich., will ask bids in September for a two-story building

at its paper mill, to cost in excess of $100,000 with equipment. Billingham & Cobb, Pythian Building, are architects.

The National Stamping Co., 617 Glover Avenue, Detroit, is said to be planning the installation of additional equipment, including a power press, medium heavy-duty type.

The Aircraft Development Corporation, Detroit, has arranged for the removal of its plant from the foot of Clark Street to a new location on lower Grosse Ile, where larger shops and increased facilities will be provided.

The Federal Mogul Corporation, 11031 Shoemaker Street, Detroit, manufacturer of bearings, bushings, etc., has completed the construction of an addition to its No. 1 plant, Shoemaker Street, and will devote a considerable portion of the structure to the production of precision interchangeable bearings; the engineering division will also use a section of the unit.

In connection with its new plant at Flint, Mich., the Yellow Truck & Coach Mfg. Co., 5801 Dickens Avenue, Chicago, will build a power house to cost about $750,000 with equipment. It will be used primarily for heating service through the plant.

The Carleton Cooler Corporation, Carleton, Mich., has been organized to manufacture a small type of commercial and household refrigeration machine, ice cream cabinets, soda fountain units and a small household refrigerator. It contemplates building a plant in the near future and will ultimately make all its own products. At present parts are made by contract and the company operates its own assembly plant. It is in the market for materials and equipment.

Pittsburgh

PITTSBURGH, Aug. 29

MACHINE tool sales of importance are infrequent, but dealers and manufacturers' agents still note a good business in repair parts and lower priced machines. Few inquiries are developing except by solicitation, which is not unusual at this time of year when plans for the fall and winter are held up by vacation absences of those who authorize purchases.

The Pure Oil Co., 35 East Wacker Drive, Chicago, is arranging to discontinue operations at its refinery at Warren, Ohio, about Oct. 1. The site of nine acres of land, as well as equipment at the plant, will be placed on the market.

The Monongahela-West Penn Public Service Co., Fairmont, W. Va., is said to be planning the construction of a new steam-operated electric generating plant at Grantsville, W. Va., to cost in excess of $45,000 with equipment.

The Board of Education, Alderson, W. Va., is considering the installation of manual training equipment in a proposed three-story high school, to cost about $200,000, for which bids are being asked on a general contract until Sept. 15. Warne, Tucker & Patterson, Masonic Temple Building, Charleston, W. Va., are architects.

The Ford Motor Co., Highland Park, Detroit, is reported to be planning the construction of a new plant for the production of steel automobile wheels in the vicinity of Weirton, W. Va., and the acquisition of a 25-acre site at that place is said to be under consideration. The proposed plant is estimated to cost in excess of $500,000 with machinery.

St. Louis

ST. LOUIS, Aug. 29.

THE American Pulverizer Co., Eighteenth and Austin Streets, St. Louis, manufacturer of pulverizing and grinding machinery, has acquired more than one acre in the Evans & Howard industrial tract and is said to be planning the early erection of a new one-story plant, to cost more than $50,000 with equipment. Edward Elsmeyer is president.

The Alois Aufrichtig Copper, Sheet & Iron Mfg. Co., 900 South Third Street, St. Louis, will begin excavations for a new one-story plant, 150 x 240 ft., for which a general contract has been let to William H. & Nelson Cunliff, 410 North Euclid Avenue, to cost close to $100,000 with equipment. Manske & Bartling, 410 North Euclid Avenue, are architects.

The Southern Kansas Gas Co., Chanute, Kan., recently organized to take over a number of natural gas properties in the southern part of Kansas, including those heretofore held by the Ash Grove Lime & Portland Cement Co., J. B. Kirk Gas & Smelting Co., and the Peerless Oil & Refining Co., is arranging for a bond sale of $2,500,000, a portion of the proceeds to be used for the properties noted, and for extensions and betterments, including pipe line construction, etc.

The Bird Wing Aircraft Co., St. Joseph, Mo., is considering the construction of a new plant for airplane manufacture, including assembling. The initial building will be one story, and cost about $30,000 with equipment. It will have a capacity of about 10 complete airplanes per month.

The Missouri Pacific Railway Co., Railway Exchange Building, St. Louis, will soon begin the erection of a one-story boiler and tank plate shop on Ewing Avenue, 133 x 142 ft., to cost more than $50,000 with equipment. A portion of the structure will be used for forge and blacksmithing service. E. A. Hadley is chief engineer.

The National Zinc Co., Bartlesville, Okla., has awarded contract to the Kansas City Structural Steel Co., Kansas City, Mo., for a one- and three-story building, 100 x 300 ft., to be used as an acid plant, estimated to cost more than $500,000 with machinery. The company has also approved plans for a new five-story smelting plant, 50 x 300 ft., to cost approximately $375,000 with equipment, and for which superstructure will soon begin.

Gill & Jackson, Buder Building, St. Louis, architects, have plans under way for a six-story automobile service, repair and garage building to cost $200,000 with equipment.

The Kansas City Power & Light Co., Fourteenth Street and Grand Avenue, Kansas City, Mo., is planning extensions and improvements in its power plant at 109 Grand Avenue, to cost $50,000 with equipment.

The State Department of Education, Little Rock, Ark., has secured authority to construct two vocational schools for which appropriations will be arranged at an early date. A site has been selected at Huntsville for one of the structures and plans will soon be drawn. A location for the other school will be determined within a few weeks.

The Southwestern Airplane Co., Atlas Life Building, Tulsa, Okla., is said to have preliminary plans for a new plant for the manufacture of aircraft and parts, with assembling works, to cost close to $30,000. An airport is projected in connection with the plant. R. F. Garland is president.

Hughes & Sanders, 205 Cole Building, Tulsa, Okla., engineers, have secured permission for a hydroelectric power plant near Fairfax, Okla., for a company now being formed by D. E. Johnson, Fairfax, and associates, to cost in excess of $1,000,000.

The Harnischfeger Corporation, Milwaukee, has opened a new branch office at 524 Buder Building, St. Louis. L. J. DeHoney will direct the sales engineering work in this territory.

Cincinnati

CINCINNATI, Aug. 29.

THE Columbus Railway, Power & Light Co., Columbus, Ohio, has arranged for a bond issue of $13,000,000, a portion of the proceeds to be used for extensions and improvements in power plants and system.

The Fuller Automobile Co., 2935 Reading Road, Cincinnati, has awarded a general contract to the Ferro Concrete Construction Co., Third and Elm Streets, for a two-story service and repair addition, to cost upward of $60,000 with equipment. Zettle & Rapp, Mercantile Library Building, are architects.

The Air Corps, Material Division, Wright Field, Dayton, Ohio, is asking bids until Sept. 8 for aircraft storage batteries; until Sept. 12 for airplane landing disk wheels with brakes.

The State Department of Highways and Public Works, Ohio Hartman Building, Columbus, Ohio, has awarded a general contract to McCurran Brothers, Xenia, Ohio, for a one-story automobile service, repair and garage building at Chillicothe, Ohio, to cost $55,000.

The Shartle Machine Co., 369 Dublin Avenue, Columbus, Ohio, has inquiries out for two 150-hp. boilers, Scotch marine or economic type, each to have 1500 sq. ft. in boiler heating surface; also for a wire straightener for ¼-in. material.

The Cincinnati Street Railway Co., Cincinnati, has plans for a group of new automatic power substations for its traction system, to cost $750,000 with equipment. The company recently entered into contract with the Union Gas & Electric Co., Cincinnati, for power supply, which will arrange facilities for the increased service.

The Kingsport Foundries, Inc., Kingsport, Tenn., W. E. Ring, vice-president and general manager, recently organized, has approved plans for initial buildings for its proposed plant, consisting of a one-story machine shop and foundry, 80 x 150 ft.; one-story pattern shop, 35 x 55 ft., and office, 32 x 35 ft. It will specialize in the production of steel castings for mill and blast furnace use, and will also conduct a general jobbing business. The plant is estimated to cost $50,000 with machinery.

The American Car & Foundry Co., 30 Church Street, New York, will discontinue operations at its plant at Memphis, Tenn. It is understood that considerable equipment

at the works will be distributed among other plants of the company.

Snyder & Babbitt, 16 East Broad Street, Columbus, Ohio, architects, have plans in progress for a five-story automobile service, repair and garage building, to cost $350,000 with equipment.

The Southern Brass Co., Chattanooga, Tenn., has concluded arrangements for the purchase of the plant and property of the Lancaster Metal Products Co., Manufacturers' Road, North Chattanooga, and will take immediate possession. Plans are under way for enlargements, including the construction of a brass foundry with initial output of 10 tons per day, and a one-story addition to the present machine shop. H. J. Weeks is president of the purchasing company.

Buffalo

BUFFALO, Aug. 29.

THE Robinson Knife Co., Cuba, N. Y., manufacturer of cutlery, with main plant at Bradford, Pa., is planning for the removal of its first noted plant to Bradford and the enlargement of the latter works to accommodate the increase. Financing is being arranged to carry out the project.

The Department of Parks and Public Buildings, City and County Hall, Buffalo, James P. Moore, commissioner, is asking bids until Sept. 9 for a quantity of perforated corrugated pipe for use at the Buffalo airport.

The Buffalo Garage Co., 101 Oak Street, Buffalo, has awarded a general contract to J. O. Cristina, Gerrans Building, for a four-story addition to its service, repair and garage building, to cost close to $85,000 with equipment. Harold J. Cook, 438 Delaware Avenue, is architect.

The Wright-Hargreaves Mines, Ltd., Lafayette Building, Buffalo, operating gold-mining properties in the Kirkland Lake, Ont., district, is reported to be planning extensions in its milling plant and the installation of additional machinery.

The General Railway Signal Co., Rochester, N. Y., has acquired patent rights from the Miller Train Control Corporation for the manufacture of Miller railroad devices and equipment in the United States and foreign countries. Facilities will be arranged for the increased production.

The Edward C. Chappelle Co., Inc., Syracuse, N. Y., manufacturer of pipe-making machinery for furnace flues, etc., has purchased property at Great Bend, Pa., and will remodel for a new branch plant.

The Decorated Specialty Paper Mfg. Co., Skaneateles Falls, N. Y., recently organized by Ernest B. and Robert B. Brewster, Skaneateles, is said to be planning the early operation of a local mill for the manufacture of a special line of paper products.

The Cleveland & Buffalo Transit Co., Lake front and foot of East Ninth Street, Cleveland, is completing plans for a new terminal on the Colt slip, foot of Erie Street, Buffalo, to cost $1,000,000 with equipment. William S. Lougee, Marshall Building, Cleveland, is architect.

The Pierce Roofing Co., Olean, N. Y., is in the market for an 8-ft. steel hand-bending brake, similar to the Dreis & Krump product.

Cleveland

CLEVELAND, Aug. 29.

BUYERS are showing a little more interest in the market than recently and manufacturers and dealers look for somewhat better business after the National Machine Tool Exposition in Cleveland in September. Sales the past week have been limited to single machines and no lots of any size are in prospect. The volume of business during August will show little change from that in July.

The Cleveland Punch & Shear Works, 3917 St. Clair Avenue, Cleveland, has awarded a general contract to the Hecker-Moon Co., 8701 Union Avenue, for its one and three-story addition, 66 x 157 ft., to cost in excess of $100,000 with equipment. Wilbur Watson & Associates, 4614 Prospect Avenue, are architects.

The Modern Mfg. Co., 4734 Hough Avenue, Cleveland, manufacturer of heaters, etc., has filed plans for a one and two-story plant, 120 x 160 ft., to cost more than $75,000 with equipment. W. F. Bach is secretary.

The National Air Transport, Inc., E. P. Lott, Municipal Airport, Chicago, general manager of operations, is planning the establishment of maintenance and repair shops for airplane and airplane engine service at Cleveland, to be used in connection with the operation of air mail route for the Government from New York to Cleveland to Chicago, effective Sept. 1. The division headquarters at Cleveland will also include facilities for other aircraft repair and parts work. The Eastern terminal of the company will be at the Hadley Field, near New Brunswick, N. J.

The Central Alloy Steel Corporation, Canton, Ohio, has begun the rebuilding of the portion of its works destroyed by fire a few months ago, to be one-story, 160 x 420 ft., to cost in excess of $85,000 with equipment. General contract has been let to the R. H. Evans Co., Daily News Building, Canton.

The Willys-Overland Co., Toledo, Ohio, manufacturer of automobiles, has awarded a general contract without competition to H. J. Speiker & Co., Elm and Utica Streets, for a one-story addition, to cost $275,000 with equipment.

The Champion Spark Plug Co., Toledo, Ohio, will install additional equipment at its plant for larger output, to be used primarily for special spark plugs for Ford automobiles.

The Cleveland office of the Cutler-Hammer Mfg. Co., Milwaukee, maker of electric controlling devices, has been removed from the Guardian Trust Building to 1905 Guarantee Title Building.

Chicago

CHICAGO, Aug. 29.

SALES of machine tools have been few and the total August business will not equal that of July. Fresh inquiry is dull, with little promise that September orders will show much improvement. Manufacturers of agricultural machinery are still in the market with sizable inquiries and the trade is awaiting a list from a Racine, Wis., plant. The Nash Motors Co., Kenosha, Wis., is showing interest in several tools. Railroad orders include a crank shaper by the Chicago & North Western, and a used boring mill by the Chicago, Milwaukee & St. Paul. The New York Central will take prices on three grinders and the Chicago & North Western will buy an open-side planer. The International Harvester Co., Moline, Ill., is in the market for several squaring shears.

J. H. Keeney & Sons, 700 East Fortieth Street, Chicago, manufacturers of plumbing supplies, will build a factory addition, 53 x 59-ft. to cost $10,000.

The Robert J. Rote Co., 1224 Fifth Avenue, Rock Island, Ill., has taken over the former plant of the Rock Island Register Co., at the above address to expand the business. The company manufactures stampings, dies and tools and does general contract manufacturing, engineering and machine work.

The Johnson-Beckwith Co., 524 Union Davenport Bank Building, Davenport, Iowa, has been appointed representative for the Harnischfeger Corporation, Milwaukee, manufacturer of power shovels, draglines, clamshell equipped cranes, etc.

The Standard Screen Co., 1844 West Hastings Street, Chicago, is said to be planning to rebuild the portion of its factory recently destroyed by fire, with loss of about $25,000 including equipment.

The Indian Refining Co., Lawrenceville, Ill., producer of refined oils, is considering extensions and improvements in its car shops at South City, including installation of additional equipment. The company also plans the erection of a steam power plant at Lawrenceville, to cost upward of $40,000 with equipment. H. K. Harshberger is chief engineer.

The International Harvester Co., 606 South Michigan Avenue, Chicago, is asking bids on a general contract until Sept. 7, for a one and two-story factory branch and distributing plant, 78 x 537 ft., at Dubuque, Iowa, to cost in excess of $90,000 with equipment.

The Limestone Fertilizer Co., Burlington, Iowa, is said to be planning the early construction of a new plant on the Delbee Creek, about 15 miles from the city, to cost more than $100,000 including equipment. It is purposed to build a powerhouse and machine shop.

The Standard Oil Co., 910 South Michigan Avenue, Chicago, contemplates the rebuilding of the portion of the oil storage division at its refinery at Woodriver, Ill., recently destroyed by fire with loss reported at $35,000 including equipment.

The Inland Wire & Cable Co., 111 West Washington Street, Chicago, recently organized to take over and consolidate the Chicago Insulated Wire & Mfg. Co., and the Illinois Wire & Cable Co., has arranged for a common stock issue of $662,500, a portion of the fund to be used for the consolidation and for expansion.

The Great Northern Railway Co., Railway Building, St. Paul, Minn., will soon begin the construction of an addition to its engine house in the East Side district, to cost about $50,000. T. D. McMahon is company architect.

The Board of Education, City Hall, Minneapolis, Minn., has plans under way for the first unit of a proposed vocational high school group, to be five-stories, to cost close to $850,000 with equipment. Other units will be built later. George F. Womrath is superintendent, in charge.

Swift & Co., Union Stock Yards, Chicago, and Fifth Street and Broadway, South St. Paul, Minn., meat packers, are said to be planning the installation of cold storage and refrigerating equipment in a six-story addition to the South St. Paul packing plant, to cost $125,000.

The Bohnsack Brick Co., 133 West Washington Street, Chicago, is planning to rebuild the portion of its plant recently destroyed by fire, with loss close to $500,000 including equipment.

The Avery Brundage Co., East Congress and South Michigan Avenue, Chicago, general contractors, have acquired property, 100 x 180 ft., at 18 Ada Street, improved with two-story factory, and will remodel for a new equipment storage and distributing plant, with repair and reconditioning department.

Frank A. Carpenter, Brown Building, Rockford, Ill., architect, has plans for five-story automobile service, repair and garage building, 65 x 156 ft., to cost in excess of $175,000 with equipment.

The Chicago-Nash Co., 2000 South Michigan Avenue, Chicago, representative for the Nash automobile, will soon begin the erection of a new service and repair division, to total about 21,000 sq. ft. of floor space, to cost close to $75,000 with equipment.

Gulf States

BIRMINGHAM, Aug. 29.

THE Texas Electric Service Co., Dallas, Tex., has begun the erection of a new steam-operated electric generating plant at Odessa, Tex., for service in the oil fields in this district. A transmission line will be constructed. The project is reported to cost more than $250,000.

The Marshall Wood Products Co., Marshall, Tex., affiliated with the Linden Chair Co., same place, is considering the erection of a new two unit plant to serve both interests, to cost approximately $75,000 with machinery.

James B. Evans, Beaumont, Tex., and associates have acquired the plant of the Yuba Oil Refining Co., Nacogdoches, Tex., for $100,000. The plant has been idle for some time. The new owners plan extensions and improvements, including equipment replacements, and will resume operations soon.

The City Water Department, Baton Rouge, La., is planning the early construction of a new pumping plant on the Bogan and Sanchez property, to cost close to $35,000.

The Tennessee Coal, Iron & Railroad Co., Birmingham, is reported to be planning the opening of new dolomite quarries in the Bessemer district for raw material supply at its furnaces, and will install equipment for development and transportation. The project is estimated to cost more than $350,000.

The Central & South West Utilities Co., 1100 Allen Building, Dallas, Tex., is said to be considering the construction of a new power plant at Lake Pauline, Quanah, Tex., where a tract of about 1500 acres has been acquired. A transmission line will be built. The project is reported to cost more than $1,500,000 with machinery. R. D. Hunter is one of the heads of the company, in charge.

The Corpus Christi-Oldsmobile Co., Corpus Christi, Tex., representative for the Oldsmobile, is planning the early erection of a two-story service, repair and garage building, 50 x 160 ft., to cost in excess of $65,000 with equipment. The latter will include a number of machine tools.

The Sweetwater Refining Co., Sweetwater, Tex., is said to be planning enlargements in its oil refinery to double, approximately, the present capacity. The company was recently chartered under State laws. C. H. Travis and A. R. Stribling are heads.

The Humble Oil & Refining Co., Houston, Tex., is planning extensions and improvements in its storage and distributing plant at Ingleside, Tex., to include the installation of a battery of 30 steel storage tanks, each with capacity of 64,000 bbl., pumping and other equipment for pipe line service in the west Texas district where a 400-mile pipe line is now in course of construction. The expansion at Ingleside will cost in excess of $400,000.

The Ouachita Ice & Fuel Co., West Monroe, La., is completing plans for a new ice-manufacturing and cold storage plant, to cost in excess of $45,000 with machinery. George E. Wells, Security Building, St. Louis, is consulting engineer.

The Andalusia Light & Power Co., Andalusia, La., has authorized the immediate erection of a new steam-operated electric power plant, to cost more than $85,000 with machinery. In addition to main units, electrically-operated air compressors, pumping equipment and auxiliaries will be installed. The structure will replace a power station recently destroyed by fire. J. E. Van Hoose is general manager.

Biedenhard Brothers, Monroe, La., will soon begin the erection of a one-story automobile service, repair and garage building, 80 x 250 ft., to cost $80,000 with equipment.

The West Texas Gas Co., Plainview, Tex., is planning the construction of a new regulator station and booster plant for use in connection with a new pipe line to be constructed from the Amarillo gas fields to this locality. The entire project will cost close to $5,000,000, including branch distributing pipe lines to Lockney, Lubbock, Tahoka, Slaton and other points.

The Common Council, Devine, Tex., is planning the installation of an elevated steel tank and tower in connection with extensions and improvements in the water system. A bond issue of $50,000 has been approved.

The Board of Trustees, Common School District No. 16, Clinton, Tex., is considering the installation of manual training equipment in a proposed junior high school to cost $150,000. John McLelland, West Building, Houston, Tex., is architect.

Indiana

INDIANAPOLIS, Aug. 29.

PLANS are being considered by the Red Ball Motor Truck Corporation, Illinois Building, Indianapolis, Ward B. Hiner, president, for a three-story addition to its plant at Frankfort, Ind., to cost in excess of $200,000 with equipment.

The United States Electric Corporation is being organized under Delaware laws with capital of 30,000 shares of stock, no par value, to take over and consolidate five going companies specializing in the manufacture of radio instruments and equipment, including the Indiana Electric Mfg. Co., Marion, Ind.; Slagle Radio Co., Fort Wayne, Ind.; Apex Electrical Mfg. Co., 1410 West Fifty-ninth Street, and the Sentinel Mfg. Co., both of Chicago; and the Workrite Mfg. Co., 1812 East Thirtieth Street, Cleveland. The new company expects to maintain production at all present units and will develop also a line of automotive electrical products. Plans are under way for a new central electrical engineering laboratory for testing and research work at Chicago, which likely will become headquarters for the organization. Allen G. Messick, head of the Robbins Body Co., Cleveland, will be president of the new company; Carl D. Boyd, heretofore vice-president of the Apex company, will be first vice-president; P. K. Romey, heretofore vice-president of the Slagle company, secretary; and John T. Beatty, vice-president of the Sentinel company, treasurer. A. E. Case, V. H. Meyer and L. E. Slagle, previously presidents of the Indiana Electric, Workrite and Slagle companies, respectively, will be active in the new corporation.

The City Council, Huntington, Ind., is considering extensions and improvements in the municipal electric light and power plant, including the installation of additional equipment.

The Northern Indiana Public Service Co., Kokomo, Ind., is planning a preferred stock issue to total $1,300,000, a portion of the fund to be used for extensions and betterments in power plants and system.

The United States Furniture Co., Evansville, Ind., is completing plans for its proposed new multi-story plant, to cost approximately $120,000 with equipment. It will replace a recent fire loss.

The J. R. Grantham Motor Sales Co., 541 Washington Street, Gary, Ind., has plans under way for a new three-story service, repair and sales building, 75 x 110 ft., to cost $110,000 with equipment. Joseph H. Wildermuth, 583 Broadway, is architect.

The General Fiber Products, Inc., Indianapolis, is being formed under State laws with a capital of $1,000,000, and 50,000 shares of stock, no par value, to take over and expand the Rockwood Mfg. Co., 1801 English Avenue, manufacturer of pulleys, transmission mechanisms, etc. Plans will be carried out for increase in production. The new company will be headed by George O. Rockwood, now president of the Rockwood organization; William M. Rockwood, now secretary; William D. Hamerstadt, Indianapolis; and John M. Browning, Mayville, Ky.

The Industrial Supply Co., Terre Haute, Ind., is having plans drawn for a two-story addition to cost about $24,000. Miller, Miller & Yeager, 30 North Fifth Street, are architects.

Pacific Coast

SAN FRANCISCO, Aug. 24.

THE Firestone Tire & Rubber Co., Akron, Ohio, has engaged Curlett & Beelman, Union Bank Building, Los Angeles, architects, to prepare plans for initial buildings for its new plant on a 45-acre tract in the South Gate

district, recently acquired. The project will consist of a group of six or seven buildings, including power plant, to cost more than $5,000,000 with machinery. It is purposed to ask bids in September. Plans for the power station will be prepared by Stone & Webster, Inc., Laughlin Building, Los Angeles, engineer.

The Board of Trustees, University of California, Berkeley, will soon take bids for a new steam power plant to cost $50,000 with equipment. William C. Hays, First National Bank Building, San Francisco, is architect.

The Bunker Hill & Sullivan Mining & Concentrating Co., Kellogg, Idaho, has begun the erection of a new electrolytic zinc plant near Kellogg. The structure is scheduled for completion in about seven months, and is estimated to cost $1,000,000 with machinery.

The International Portland Cement Co., Colville, Wash., has plans under way for extensions and improvements in its mill at Cowell, about 14 miles from the city, including the electrification of a portion of the plant, to cost about $35,000. Additional equipment will be installed.

The La Ballona School District, Culver City, Cal., is planning the construction of a one-story vocational shop at the local high school. Richard M. Bates, 660 South Vermont Avenue, Los Angeles, is architect.

The Southern Counties Gas Co., Monrovia, Cal., is planning for extensions and improvements in its artificial gas plant and system, with installation of additional equipment, to cost about $200,000.

M. G. Henry, 414 California Building, Tacoma, Wash., is planning to purchase a quantity of mining machinery and affiliated equipment, including concentrating tables, flotation machines, caterpillar tractor, donkey engine, waterwheel, dump cars, electric dynamo, galvanized pipe, etc., for an installation in this section.

The Gem Stone Silica Co., Wenatchee, Wash., has plans for a new plant for the production of cast stone products, including crushing unit, 60 x 100 ft.; casting shop, 42 x 80 ft., laboratory, warehouse and other structures, to cost $125,000 with machinery. C. W. Smith, Oroville, Wash., is mining engineer for the project.

The Mesa Dairy & Ice Co., Mesa, Ariz., is planning extensions in its ice-manufacturing plant, to cost in excess of $60,000 with equipment.

The Marion Steam Shovel Co., Marion, Ohio, will establish district offices at 54 Fourth Street, Portland, Ore., with H. A. Niles, manager.

The N. & S. Foundry Co., 1144 Elliott Avenue West, Portland, Ore., will build a two-story addition to its plant.

The Palladay Welding Works has leased 2500 sq. ft. of space at 104 North Broadway, Portland, for an electric and acetylene welding shop. Harry A. Palladay is manager.

The Northwest Equipment Co., Billings, Mont., has been appointed representative in Montana for the Harnischfeger Corporation, Milwaukee.

Canada

TORONTO, Aug. 29.

PROSPECTIVE machine tool business indicates that a strong demand will continue until well up to the close of the year. The showing of tools at the Canadian National Exhibition that opened at Toronto Aug. 27, is of a wider variety than in former years and machine tool builders look for a general increase in orders during the next two weeks as a result. Sales the past week were up to the average and inquiries were somewhat better.

The National Mfg. Co., 360 Dufferin Street, Toronto, is in the market for a turret lathe with 8-in. swing, with tools and equipment; a standard lathe, 8-in. swing, with tools and equipment; two large electric drills, maximum 1-in.; two small electric drills, maximum ½-in.; four grinders; electric welding apparatus; rolls and equipment for light sheet metal, maximum 30-in. bend.

According to Bernard H. Prack, architect, 42 James Street North, Hamilton, Ont., there will be no further developments in connection with bids for additions to the plant of the Canadian Westinghouse Co., Ltd., Hamilton, Ont., until after the meeting of the directors on Sept. 7. Plans have been prepared, however, and it is understood that bids will be called immediately after the meeting for the erection of a brass foundry, a car building and new office building.

Plans are nearing completion for an addition to the plant of the Firestone Tire & Rubber Co., Hamilton, Ont. Hutton & Souter, architects and engineers, will call for bids for the erection of a factory, 266 x 280 ft., the first story to be of reinforced concrete and the second of structural steel, to cost $200,000.

The Lunenburg Foundry Co., Ltd., Lunenburg, N. S., contemplates a number of extensions and improvements to its plant. Preparations are under way for additions to the main plant and foundry.

Plans are being prepared by Hutton & Souter, architects, Hamilton, Ont., for an addition to the plant of the Phillips Glass Co., Oshawa, Ont. It will be 100 x 100 ft. of steel, brick and reinforced concrete, equipped with traveling cranes.

Bids are being called by Hutton & Souter, Hamilton, Ont., for the erection of a mill stock building at Oshawa, Ont., for the General Motors of Canada, Ltd., 75 x 300 ft.

The Fisher-Quebec Gold Mines will install a mining plant at its property at Fisher Station, near Amos, Que.

The Quebec Docking & Ship Repairing Co., Ltd., Quebec, recently incorporated with a capital stock of $250,000, will build a railroad dry dock on the eastern bank of the St. Charles River capable of receiving vessels up to 2000 tons.

The Carpenter-Hixon Co., Ltd., Blind River, Ont., has started work by day labor on the construction of a lumber mill to cost approximately $6,000,000, to be completed by January, 1928. The owners are in the market for equipment and material.

The Aluminum Co. of Canada, Ltd., 158 Sterling Road, Toronto, is building a $25,000 addition to its plant.

The Canada Spool & Bobbin Co., Ltd., Durham Street, Walkerton, Ont., will build a one-story, 40 x 80 ft., addition.

Western Canada

The National Bond & Discount Corporation, Portland, B. C., proposes to build a power plant at Shusway Falls, near Vernon, B. C., to cost $200,000.

Bids will be called soon by McNair Shingle Co., Ltd., foot of Cassair Street, Vancouver, B. C., for the erection of a mill and kiln to cost $60,000.

Foreign

THE Sao Paulo Tramway, Light & Power Co., Sao Paulo, Brazil, has authorized the construction of a new hydroelectric generating plant near the city with an initial capacity of 80,000 hp. Extensions will be made in transmission lines. The entire project is reported to cost in excess of $400,000. The company has work in progress on another hydroelectric power development with capacity of 29,500 hp.

The Allgemeine Elektrizitaets Gesellschaft, Berlin, Germany (commonly known as the German General Eectric Co.), manufacturer of electrical machinery, has called a special meeting of stockholders Sept. 19, to approve an increase in capital from 30,000,000 to 150,000,000 marks, a portion of the proceeds to be used for expansion in production. The company is said to have orders on hand for 60 per cent in excess of those at the same time a year ago.

The French Senate, Paris, has granted a concession to the Societe des Forces Motrices du Haut-Rhin, Paris, for the construction of a power dam and hydroelectric generating plant on the Rhine River, near Kembs. The project provides for funds to be advanced by the State for the construction, to be repaid by the company, effective with operation of plant, in eight installments. It is reported to cost more than $350,000.

In connection with a new port works at Antofagasta, Chile, the Ministry of Public Works has arranged a fund of 90,867,328 pesos (about $10,900,000), for the second portion of the development, now to proceed, the first portion covering breakwater, etc. The new work will include three piers and a number of warehouses, with installation of electric cranes, conveying machinery and other mechanical-handling equipment.

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